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Adeline Saillard, Thomas Url

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VENTURE CAPITAL IN BANK- AND MARKET-BASED ECONOMIES

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Adeline SAILLARD*
University of Paris I Panthéon-Sorbonne (CES) –Paris School of Economics

Thomas URL**
WIFO, Austrian Institute of Economic Research

Abstract: The determinants of venture capital investment have attracted a significant amount of attention from both academics and policymakers. We use a version of the Keuschnigg–Nielsen model for venture-capital-financed projects to condition our analysis on a reasonable set of exogenous variables but we focus on one determinant: financial market structure. The type of financial market structure (bank- or market-based) contributes substantially to explaining differences among countries with respect to the extent of venture capital investments in the initial business stages. We will use the cross country and time series variation from a panel of 19 industrial countries to support the hypothesis that venture capital thrives within market-based financial systems and is confined to an ancillary role in bank-based systems.

Keywords: Venture capital, financial market structure, local stock markets, panel data.

Résumé : Les déterminants du capital risque attirent l'attention des politiques comme des scientifiques. Nous utilisons un modèle de Keuschnigg et Nielsen pour guider le choix de nos variables exogènes même si nous concentrons notre analyse sur un seul déterminant : la structure financière. Le type de structure financière (basée sur les banques ou sur les marchés) contribue de manière substantielle à expliquer les différences selon les pays des premières phases d'investissement en capital risque. Nous utilisons un échantillon de 19 pays pour appuyer l'hypothèse que le capital risque prospère dans les économies basées sur les marchés alors qu'il est confiné dans un rôle secondaire dans les économies basées sur les banques.

Mots clefs : Capital-risque, Structure financière, Données de panel.

JEL-classification: G24, O16, O50.

* 106-112 Boulevard de l'Hôpital, 75013 Paris France106-112 Boulevard de l'Hôpital, 75013 Paris Adeline. E-mail: adeline.saillard@univ-paris1.fr – corresponding author.

** Arsenal Object 20, A-1030 Vienna Austria E-mail: Thomas.Url@wifo.ac.at

1. Introduction

The role of venture capital for seed finance and start-ups has been growing throughout recent decades. During the founding phase, entrepreneurs are usually short of cash and they are unable to finance their new projects fully out of their own pockets or the projects' cash flow. If the business requires a long run-up phase, during which effort goes into product and service development, the cash flow may even be negative for years to come. Uncertainty surrounding the project's outcome and asymmetric information about the level of effort spent by the entrepreneur will aggravate the difficulties to acquire external debt finance. Moreover, young firms – especially in innovative sectors – are often characterized by a substantial amount of intangible assets, which cannot be used as collateral against bank loans (Hart and Moore, 1994), further lowering their prospects for gaining access to debt financing. In such an environment venture capital may provide the only potential source of finance.

Gompers (1995) and Lerner (1995A) were among the first to point out the importance of venture capital in financing projects with an asymmetric informational structure between the entrepreneur and the investor and a high degree of uncertainty, though the practice of providing venture capital dates back to the first years after World War II (Gompers and Lerner, 1998). Since then venture capital has emerged as a distinct financial branch with newly raised seed and start-up capital corresponding to 0.5 percent of gross fixed capital formation of the US private non-financial sector.

The USA is not only the place where venture capital was invented; it is also the nation with the world's most developed venture capital market. This may be attributable to path dependence of financial markets, favorable capital gains taxation, the long-lasting effect of allowing pension funds to invest in venture capital, the reputation of a set of well-known fund managers, or the very well-developed institutions that track the returns of venture capital funds (Gompers and Lerner, 1998). Nevertheless, despite a rather homogenous legal and economic system and a common understanding in the society about the importance of risk taking and entrepreneurship, the activity of US venture funds is extremely concentrated in four states. California, Massachusetts, New York, and Texas account for 57 percent of the total venture capital invested (cf. Gompers and Lerner table 3.2). If we rank US states by their ratio of invested venture capital to state gross domestic product (GDP), the ten states with the highest ratio comprise New England and surroundings, California, Colorado, Oregon, and Pennsylvania. Of these states only Colorado and Oregon show up as regional outliers. Gompers and Lerner (1998) show in a cross section of US states that industrial and academic research and development spending is significantly related to both the number of firms receiving venture capital as well as the amount of venture capital. Their regression explains about 43 percent of the inter-state variation in per-capita venture capital investment, although the ratio of venture capital to state-GDP varies between 0.3 (Hawaii) and 6.4 (Vermont) percent.

Given the large differences across US states it may seem curious to look for a relation between financial market structure and the extent of venture capital finance. Moreover, Allen and Gale (2000) argue in their comparison of financial systems that financial intermediaries

provide alternative substitutes for financial markets and offer institutional arrangements that correct existing market failures. Therefore, market-based systems are not on a priori grounds a more efficient mechanism to allocate capital within an economy. Their reasoning is supported empirically by Beck and Levine (2002) who test the relative merits of financial structure in fostering economic performance. Overall, they conclude that industrial growth patterns and the efficiency of capital allocation do not vary systematically over countries with different financial structure, rather, the overall level of financial development and the efficiency of the legal system are more useful predictors for the number of establishments and value-added growth. Beck and Levine (2004) and Hahn (2008) extend this result to aggregate economic growth and show that: both well-developed stock markets and financial intermediaries support economic growth.

There are at least three arguments challenging this result. We have already mentioned the lack of recyclable assets in start-ups emphasized by Hart and Moore (1994) as a brake to debt finance for high-technology start-ups. Additionally, Allen and Gale (1999) offer a more nuanced view of the information processing capacities of markets versus intermediaries and Black and Gilson (1998) underline the importance of returning control rights from the venture capitalist to the entrepreneur upon exit.

In the model of Allen and Gale (1999) markets are good at collecting and aggregating diverse opinions about uncertain business projects associated with innovative new technologies. They argue that stock markets provide incentives for a large number of investors to monitor the management's performance. This activity is useful for production processes with (1) long periods between the adoption of the business plan and the observed success or failure, and where (2) rapid technological change is highly relevant (Allen, 1993). Under these circumstances there will be very little consensus among investors about the effectiveness of the new technology or the best way to run the firm. This is less a consequence of differing access to data rather than investors interpreting existing data in various ways and forming diverging opinions on efficient contingent management actions.

Financial intermediaries, on the other hand, benefit from increasing returns of scale in processing standardized and homogenous information (Diamond, 1984). Because banks often assess similar decision-making processes in conventional firms, they benefit from returns of scale in project evaluation and monitoring the continuity of interest and redemption payments. This knowledge, however, offers no advantage for the evaluation of seed or start-up firms in new industries with a short history of data or no comparable track record. On the contrary, in such an environment markets have an advantage over intermediaries because they offer the opportunity for a large number of people to participate directly in the investment decision. Although it is costly for investors to acquire the relevant information individually, the aggregation of individual information sets and expectations through markets increases the number of innovative projects gaining access to finance (Allen and Gale, 1999). It is only when beliefs among investors become correlated, i. e. their evaluations of firms converge to a common value, that the delegation of investment decisions to an intermediary becomes profitable.

Black and Gilson (1998) give a completely different explanation for a positive relation between market-based systems and the extent of venture capital finance. Their argument is based on corporate control rights as they point out the explicit and implicit contractual arrangements between venture capitalists and entrepreneurs on the design of the future exit strategy. Black and Gilson's argument is based on the assumption that entrepreneurs place substantial private value on control rights over the company. The exit of venture capitalists through initial public offerings (IPO), for example, has different implications for the future control of a start-up firm as compared to the acquisition by an incumbent firm. By agreeing to a contract setting out an IPO as the preferred exit mode, the venture capitalist signals credibly to return control rights to the successful entrepreneur upon exit. For example, guaranteed board membership of the venture capitalist or veto power over business decisions typically cease after an IPO, whether or not the venture capitalist sells any shares at the IPO (Kaplan and Strömberg, 2003). Covenants of the venture capital contract will be substituted by weaker control rights of regular shareholders and often the entrepreneur retains the majority of shares. In case of an acquisition, on the other hand, control rights will be permanently withdrawn from the entrepreneur. Whereas the explicit return of control rights to the entrepreneur is difficult to implement in a venture capital contract, due to the nebulous definition of success, the fixing of an IPO as the preferred exit mode provides an attractive implicit contractual arrangement. The feasibility of an IPO as the exit route obviously depends on the structure of financial markets. In the extreme case of a completely bank-based economy such an implicit arrangement about the transfer of control rights would be impossible; in mixed systems IPOs are less likely than they are in market-based economies with vibrant stock markets.

If market-based systems are actually better at aggregating information and returning control rights to entrepreneurs, why are – even in the USA – acquisitions still an important way to exit ventures? Cochrane (2005) provides evidence that about 50 percent of the number of exits from US ventures use the acquisition mode and that the modal value of the rate of return distribution is about the same for IPOs and acquisitions, though acquisitions realize more negative or below-average returns, indicating a selection bias and pushing the mean rate of return for acquisitions below that of IPOs. Norbäck and Persson (2009) compare the total value of acquisitions with that of IPOs. Over the period from 1999 through 2005 they show that in the US market the value of acquisitions always surpassed that of IPOs: by a factor of as much as five around the year 2000. As an explanation they suggest a model of venture capital finance that threatens rents achieved by incumbents on oligopolistic markets. Venture capital backed innovations are carried out because these rents can be extracted by selling the successful venture to one of the incumbent firms. This exit channel does not depend on the structure of financial markets but relies on positive strategic product market effects on the sales price of the venture.

In this paper we will extend the anecdotal evidence for a positive relation between market-based financial markets and the extent of venture capital finance presented by Black and Gilson (1998). They present several indicators for seven industrial countries and show that bank-based nations commit a comparatively lower amount to venture capital. Moreover, those investments tend to be concentrated in latter stage financing rather than in seed money or start-ups. We will use the cross country and time series variation from a panel of industrial

countries to support the hypothesis that venture capital thrives within market-based financial systems and is confined to an ancillary role in bank-based systems.

As a measure for financial market structure we use the index suggested by Demirguc-Kunt and Levine (1999) as an additional explanatory variable in a panel regression explaining the share of seed and start-up investments in tangible and intangible capital formation. The index by Kunt and Levine is a continuous number increasing in the extent of market-based features. We can thus go beyond the comparison of extreme cases like the United Kingdom's largely equity-financed capital formation during the industrial revolution (Michie, 1987) or Germany's and Japan's strength in industries pioneered in other countries (Allen and Gale, 2000, p.408). Mixed financial systems are the norm and the financial market index enables us to include information from all countries with records on seed and start-up venture capital.

We build our empirical model on the theoretical model of Keuschnigg and Nielsen (2005). This model describes the complicated fabric between entrepreneurs and venture capitalists and distinguishes between venture-capital- and bank-financed projects. Their model provides us with the identification of the relevant variables determining the equilibrium level of venture-capital-based investments. The conditioning assumptions derived from it suggest a regression equation which allows us to provide robust evidence for the hypothesis that market-based economies nourish venture capital.

There are other papers related to our topic but they focus more strongly on the relation between financial structure and research and development spending or other measures of innovative activity. Lumme et al. (1994) for example, compare the balance sheet structure and growth performance of small firms in the United Kingdom and Finland. They find that UK-domiciled firms use more equity finance and grow faster than small Finnish firms. Houben and Kakes (2002) show in a cross-country analysis that the positive effects of innovation in information and communication technologies on productivity growth were mainly experienced by market-based economies.

Evidence of cash constraints for small firms with large research and development expenditures also supports the hypothesis that young innovative enterprises predominantly use equity markets as their marginal source of funds (cf. Hall (2002) for a summary of supportive empirical material). Brown et al. (2009) suggest that between 1994 and 2004 the USA experienced a finance-driven cycle in research and development spending concentrated within seven high-tech industries and mainly accounted for by young firms (defined as having had their IPO fewer than 15 years earlier). Based on firm-level panel data, Brown et al. (2009) show that research and development spending of young firms in the USA depends significantly on their access to either cash flow or external equity. Martinsson (2010) extends these results to young publicly traded high-tech firms throughout Europe and shows that firms incorporated in the United Kingdom – a market-based economy – experienced a supply shift of external equity in the late 1990s and used this money to increase research and development expenditures. New firms from continental Europe, on the other hand, received capital predominantly from internal cash flow and invested to a significantly lower degree into research and development.

In the following section we provide a short description of the financial structure index and an initial explorative view on the relation between financial market structure and the extent of venture capital investment. Section three sketches out the theoretical model for venture-capital-financed investment and derives the regression equation. Subsequently we present the data and estimation method. Section 5 presents the results, which are followed by the conclusion.

2. Characteristics of Market- and Bank-based Systems

The relative development of bank-based versus market-based financial systems depends on various economic and institutional factors. In empirical work it is convenient to have a composite measure that conveys the degree to which a financial system is bank-based or market-based in a single variable. Demirguc-Kunt and Levine (1999) propose such a measure. This index has been subsequently used by various authors as an explanatory variable for economic growth, bank profitability, corporate finance, etc. (Kunt and Levine, 2004).

The financial structure index compares the level of financial activity channeled through the stock market to that facilitated by private banks. Invariably, such a measure relies on relative volumes of transactions using either means of finance. The index combines indicators on domestic stock market capitalization, deposits at banks, stock market turnover, private credit by banks, and bank overhead costs into a real number, i.e. it is continuous and not bounded. The higher the value of the index is, the more market-based the financial system of an economy, cf. the appendix for a detailed description.

Demirguc-Kunt and Levine (1999) use data on financial development and structure from the World Bank covering in its initial version the period 1990 through 1999 on an annual basis. We use the current release of the World Bank dataset to extend Kunt and Levine's measure through 2008.[**] The index documents the degree of diversity of financial systems across developed countries. This is in line with many comparative studies of financial systems, which demonstrate persistent differences in household and business investment behavior in the OECD countries (Kunt and Levine, 2004, Ch. II.3). The ranking reveals the prevalence of bank-based financial systems in continental Europe, with Switzerland as a notable exception, while financial systems in the Anglo-Saxon countries are heavily market-based.

Figure 1 compares the average value of the index for the original period 1990 through 1999 on the horizontal axis with the averages of our new values for the period 2000 through 2008 on the vertical axis. The 45-degree line indicates countries with a stable financial system. Countries above this line experienced a movement toward a market-based financial system, countries below this line moved instead toward the direction of a bank-based economy. Overall, most countries show little variation over time. Other than Australia and the Netherlands the earlier taxonomy of countries fully prevails. Both countries show values close to zero in both periods. This indirectly corroborates findings by Bruno and De Bonis (2009) of missing convergence between financial systems across developed countries.

[**] "A New Database on Financial Development and Structure", see: http://go.worldbank.org/X23UD9QUX0

Countries showing noticeable changes in their index value comprise Finland and the USA with a shift toward a more market-based system and Denmark with a movement toward bank-based finance. In the case of Denmark this development is due to a tripling of the volume of deposits and a quadrupling of deals in credits relative to GDP, which was not fully matched by increases in components related to the stock market. Finland, on the other hand, saw a surge in stock market capitalization and turnover, while all bank-related components stagnated. The development of the US index is dominated by a swift increase in stock market turnover after 1999 and to a lesser degree by higher stock market capitalization as compared to the first half of the 1990s.

The amount of venture capital investment varies substantially across countries. In order to make it comparable, we normalize venture capital investments by gross fixed capital formation and business enterprise expenditures on research and development. This normalization approximates the share of venture capital investments in total tangible capital formation and the intangible assets accumulated by young innovative firms throughout the year (see next section for a more detailed description and reason for this measure). Figure 2 shows the relation between venture capital finance and market structure across countries using average values over the sample period. It broadly confirms the hypothesis that market-based systems nourish venture capital as they tend to use venture capital more intensively. Only Canada appears to be an outlier in Figure 2 with a balanced mix of bank- and market-based financial services but the highest VC ratio in the sample. Before we use our estimation results to refine this evidence, we will sketch out the relevant parts of the model on venture capital finance by Keuschnigg and Nielsen (2005) that helps us to restrict the parameter space.

3. Theoretical background and model specification

We use a version of the model for venture capital finance by Keuschnigg and Nielsen (2005) which already includes important policy variables like taxes on capital gains and investment subsidies. This model is based on the assumption that venture capital is a scarce and expensive resource of finance for start-up firms. It is scarce mainly because venture capitalists provide additional managerial expertise, detailed knowledge of the industry, accumulated personal experience, and a good reputation. Acquiring these capabilities and the reputation to become a successful venture capitalist takes time and is costly. The model distinguishes between bank and venture-capital-financed innovative firms but leaves the production of traditional goods aside. The main parties in the model are entrepreneurs and venture capitalists. The entrepreneurs possess business ideas and technical know-how for launching a new business but they lack advanced managerial experience and funds to implement their ideas and start up their firms. The source of venture capital, on the other hand, is not specified in the model.

The model is based on a matching equilibrium between entrepreneurs searching for finance and venture capitalists searching for promising deals. Both parties have to devote effort to make a start-up profitable but cannot observe the level of effort actually dedicated to the start-up. Specifically, the entrepreneur expends effort, e, to run a start-up firm successfully. Effort is measured as a bivariate variable taking either values of zero or one. At high levels of effort

e=1 the probability of success for a start-up rises from 0 to p_0, whereas at low levels of effort e=0, the start-up fails. Positive effort has constant effort costs on the side of the entrepreneur, β, which must be covered by the project's return. Since the level of effort, e, cannot be observed in advance and the entrepreneur has no credible signaling device, the contract design between the venture capitalist and the entrepreneur must take account of shirking. Entrepreneurs can choose between bank and venture capital finance. In the case of bank finance, risk-neutral entrepreneurs maximize their expected profits, π^B, subject to a participation constraint for the bank (PC^B) and an incentive constraint for the entrepreneur (IC^E). The participation constraint implies that the bank breaks even after providing the credit to finance tangible physical investment expenditures, I, net of public investment subsidies, z, and the base salary for the entrepreneur, $\overline{w}$. At the same time, entrepreneurs need an incentive constraint on their side, inducing a high level of effort. In the case of bank finance, the profit from the start-up results from the difference between revenues and the payback of the credit, D, plus the base salary, $\overline{w}$, of the entrepreneur. The profit from engaging in a start-up, π^B, must be at least as large as the opportunity wage of employment in the traditional goods producing sector, W, plus the costs of effort, β, from securing a successful start-up. The maximization problem for the expected profit in case of bank finance is

$$\max_e \pi^B = (1-\tau)\left(ep_0(V-D)+\overline{w}\right) \geq \beta e + W \tag{1}$$

$$\text{s.t.} \quad \text{PC}^{\text{B}} \; ep_0 D \geq (1-z)I + \overline{w}$$

$$\text{IC}^{\text{E}} \; (1-\tau)p_0(V-D) - \beta \geq 0 \;,$$

The entrepreneur's profit is measured after tax with τ representing the capital gains tax rate. For simplicity the base salary is taxed at the same rate. The banking market is assumed to be competitive. Banks will only receive a payback if the start-up is successful. Therefore, the binding participation constraint for banks under high effort e=1 produces the minimum expected repayment that banks will accept. The binding incentive constraint induces the entrepreneur to expend significant effort on the start-up because the after-tax pay-out fully compensates for the costs of effort. By substituting the binding participation constraint into the profit function, assuming that the incentive constraint binds, and furthermore assuming that free entry eliminates any excess surplus over wages in the traditional sector, W, the maximum profit under bank finance is

$$\pi^B = (1-\tau)\left(p_0 V - (1-z)I\right) = \beta + W \;, \tag{2}$$

i. e. the after-tax operating surplus of the start-up is equal to the sum of effort costs and the opportunity wage in the traditional sector. This relation also fixes the price of innovative goods at

$$V = \frac{\beta + W}{(1-\tau)p_0} + \frac{(1-z)}{p_0} I \;. \tag{3}$$

Venture capital finance differs from bank finance because venture capitalists provide funds and value-enhancing managerial advice to the start-up, whereas banks offer only credit and

lack managerial knowledge. The venture capitalist invests advisory effort, a, into the start-up. This intervention increases the quality of the product and allows the firm to acquire a premium $q(a)>1$ over the general market price, V, for the standard quality of the innovative good. The standard quality is supplied by bank-financed innovative firms. The function $q(a)$ has positive but diminishing returns in managerial advice, a. Advice implies intangible managerial effort costs, γa, on the side of the venture capitalist.

This simple set-up requires a straight equity contract anticipating that both participants have to expend enough effort in order to make the start-up successful. Because the entrepreneur has no own funds, the venture capitalist must pay for all costs of the start-up including the front-loaded base salary, $\overline{w}^E$. By paying the start-up costs, the venture capitalist acquires a share (1-s) in the start-up and participates with this share in the upside potential of the firm. The entrepreneur owns the remaining share s of the start-up. Profits for the entrepreneur, π^E, and the venture capitalist, π^F, are given by,

$$\pi^E = (1-\tau)\left[sp_0 q(a)V + \overline{w}^E\right] \geq \pi^B \tag{4}$$

$$\pi^F = (1-\tau)\left[(1-s)p_0 q(a)V - (1-z)I - \overline{w}^E\right] = \gamma\ a\ , \tag{5}$$

with the joint surplus X,

$$\begin{aligned} \mathrm{X} &= (1-\tau)\left[p_0 q(a)V - (1-z)I\right] - \gamma\ a - \pi^B \\ &= \pi^E - \pi^B + \pi^F - \gamma\ a \end{aligned}\ , \tag{6}$$

being shared between both partners according to the solution of the joint maximization problem

$$\max_{s,\overline{w}^E,e,a} \left(\pi^E - \pi^B\right)^{1-\xi} \left(\pi^F - \gamma\ a\right)^{\xi} \tag{7}$$

$$\begin{aligned} \text{s.t.} \quad & \mathrm{PC^E}\ \ \pi^E - \beta \geq \pi^B - \beta \geq W \\ & \mathrm{IC^E}\ \ (1-\tau)sp_0 q(a)V \geq \beta \\ & \mathrm{IC^F}\ \ (1-\tau)(1-s)p_0 q'(a)V \geq \gamma\ , \end{aligned}$$

where ξ represents the bargaining power of the venture capitalist. The solution of this problem follows backward induction. Agents choose their effort levels after the terms of the contract have been fixed and all start-up costs are sunk. The venture capitalist benefits from the value added by his advice at the rate (1-s) and chooses a higher effort level, a, such that $\mathrm{IC^F}$ becomes binding. The function $q'(a)$ is the derivative of the premium over the general market price with respect to the venture capitalist's effort. Solving the $\mathrm{IC^F}$ for the level of advice gives

$$a = q'^{-1}\left(\frac{\gamma}{(1-s)\left[\beta + W\right] + (1-\tau)(1-z)I}\right)\ . \tag{8}$$

The share of the entrepreneur in the start-up results from the binding IC^E constraint

$$s = \frac{\beta}{q(a)[\beta + W] + (1-\tau)(1-z)q(a)I} \ . \tag{9}$$

If this equality holds, significant effort by the entrepreneur is assured and equations (8) and (9) simultaneously determine the equity share and the extent of managerial advice. For given *a* and *s*, the venture capitalist will minimize the front-loaded base salary such that the participation constraint of the entrepreneur becomes binding. The maximum after-tax joint surplus for a deal is

$$\mathrm{X} = (1-\tau)\{(q(a)-1)[(\beta + W) + (1-\tau)(1-z)I] - \gamma\ a\} \ . \tag{10}$$

The front-loaded base salary, W, is determined by bargaining between the entrepreneur and the venture capitalist. The joint after-tax surplus will be shared according to the bargaining power as $\pi^E - \pi^B = (1-\xi)\mathrm{X}$ and $\pi^F - \gamma\ a = \xi\mathrm{X}$.

The search equilibrium crucially depends on the number of potential entrepreneurs, $\overline{E}$, and the number of venture capitalists, *F*, which are fixed in the model. $\overline{E}$ is set at a high-enough level to ensure that there will always be 'excess' entrepreneurs being sent back to bank finance. This creates free entry, eliminates profits for bank-financed start-ups, and fixes the after-tax base salary at the level of the opportunity wage in the traditional sector, $(1-\tau)\overline{w}^E = W$, while still inducing significant effort on the side of the entrepreneur.

In their search for deals venture capitalists make only a fraction *vF* of financing offers. Consequently, the number of random matchings between entrepreneurs and venture capitalists depends on equilibrium market tightness, θ:

$$\theta = \frac{\overline{E}}{vF} \ , \tag{11}$$

i. e. the ratio between potential entrepreneurs and the number of financing offers by venture capitalists. The matching probability, $f(\theta)$

$$f(\theta) = \frac{E}{vF} \ , \tag{12}$$

is the fraction of venture capital offers resulting in a deal. Both parties need an incentive to undertake search activity. The entrepreneur will engage in search activity for venture capital finance if the expected gain over a bank-financed project covers at least the costs of search effort *k*,

$$\frac{f(\theta)}{\theta}(1-\xi)\mathrm{X} \geq k \ , \tag{13}$$

The left-hand side of this equation combines the probability of finding venture capital finance for a start-up with the entrepreneur's share in the joint after-tax surplus. If the expected gain from searching exceeds the search cost, *k*, a potential entrepreneur will start looking for

venture capital finance. The venture capitalist, on the other hand, maximizes the expected surplus net of search costs, $\delta(v_i)$, with respect to the individual number of offers v_i,

$$\max_{v_i} v_i f(\theta)\xi \mathrm{X} - \delta(v_i) \ , \tag{14}$$

which results in the following optimality condition for offers by the venture capitalist,

$$f(\theta)\xi \mathrm{X} = \delta'(v_i) \ , \tag{15}$$

with $\delta'(v_i)$ representing the derivative of search costs with respect to the number of individual offers. Due to the assumption that the potential number of entrepreneurs is large enough, only a fraction of the potential entrepreneurs, $\overline{E}$, will be able to close a deal. For this reason, any excess of the expected revenue of a deal over search costs will be eliminated and inequality (13) will hold exactly. Substituting the matching probability from equation (12) and market tightness from equation (11) into equation (13) gives the number of deals as a function of search costs, the entrepreneur's share in after-tax joint profit, and the potential number of entrepreneurs,

$$\begin{aligned} E &= \frac{k}{(1-\xi)\mathrm{X}}\overline{E} \\ &= \frac{k}{(1-\xi)\{(q(a)-1)[(\beta+W)+(1-\tau)(1-z)I]-\gamma\ a\}}\overline{E} \end{aligned} \ , \tag{16}$$

Because we assume that the number of potential entrepreneurs always exceeds the number of deals, search costs have to be smaller than the share of the entrepreneur in the joint after-tax surplus. If the start-up succeeds the firm will produce one unit of output, if it fails the level of production will be zero. Accounting for differences in quality between goods produced by bank and venture capital financed start-ups, the aggregate supply will be $p_0(B+q(a)E)$ and consumers will spend the amount G on innovative goods. Due to separability and linearity of the utility function the demand for innovative goods is independent of income. The demand function depends on the price of traditional goods (numeraire set to 1), the price of innovative goods, V, and the quality premium, $q(a)$, thus $G = G(V, q(a))$ and the number of bank financed start-ups follows from the market clearing condition for innovative goods,

$$G = p_0 B + p_0 q(a)E \ , \tag{17}$$

which can be solved for B,

$$\begin{aligned} B &= \frac{G(V, q(a))}{p_0} - p_0 q(a)E \\ &= \frac{G(V, q(a))}{p_0} - \frac{p_0 q(a)k}{(1-\xi)\{(q(a)-1)[(\beta+W)+(1-\tau)(1-z)I]-\gamma\ a\}}\overline{E} \end{aligned} \ . \tag{18}$$

We are interested in the effect of the financial market structure on the extent of venture capital finance. The model by Keuschnigg – Nielsen (2005) shows that the share of venture capital investment in total investment for innovative goods depends on

$$\frac{E\left(I+\overline{w}^{E}\right)}{\left(B+E\right)\left(I+\overline{w}^{E}\right)}=\frac{p_0 k\overline{E}}{\left(1-\xi\right)\left\{\left(q(a)-1\right)\left[\left(\beta+W\right)+\left(1-\tau\right)\left(1-z\right)I\right]-\gamma\ a\right\}G\left(V,q(a)\right)-\left[1+q(a)p_0\right]p_0 k\overline{E}}\quad,\qquad(19)$$

where V and a can be eliminated by using equations (3), (8), and (9). According to this model the share of venture capital backed start-ups depends on unobservable and observable exogenous variables. The unobservable variables are search costs, k, and effort costs, β, of entrepreneurs. Also the bargaining power, ξ, the effort level of venture capitalists, a, and their costs of advice, γ, cannot be observed. On the other hand, opportunity wages, W, capital gains tax rates, τ, investment subsidies, z, the number of potential entrepreneurs, $\overline{E}$, and physical investment, I, can be observed, even the probability of success, p_0, may be approximated by actual default rates or business confidence indicators. We thus approximate equation (19) by an equation relating the ratio of venture capital investment, VC, to the sum of gross fixed capital formation in total economy, I, and business enterprise expenditures on research and development, RD:

$$\frac{VC}{\left(I+RD\right)}=f\left(W,\tau,z,\overline{E},p_0,IFMS\right)\ ,\qquad(20)$$

We approximate the entrepreneur's salary by expenditures on research and development as a measure for total run-up costs which have to be paid up front regardless of the success of a venture. Other components of intangible capital formation could be added to research and development spending but comparable data are not available for our sample of countries. Furthermore, spending on research and development is likely to form the most important part of intangible capital formation of young innovative start-ups. On top of all variables characterizing the equilibrium value of venture capital in equation (20) we will use the index for financial market structure suggested by Demirguc-Kunt and Levine (1999), *IFMS*, as an indicator for the prevalence of market- versus bank-based financial systems in a country. The panel structure of our sample will allow us to control for the effect of unobservable time invariant variables as they provide part of the explanation for cross-country variation in the extent of venture capital finance, e. g. differences in legal systems, the size and age of pension funds, labor market regulations affecting hiring and firing decisions, and cultural attitudes toward entrepreneurship.

4. Data and Estimation

We use equation (20) to choose the data transformation for our dependent variable and the set of explanatory variables to test our hypothesis of the relevance of financial market structure to the extent of venture capital finance. We restrict venture capital to investments in the seed and start-up phase of firms. The European Venture Capital Association (EVCA) and national associations provide data on seed and start-up investments of venture capital funds. Since the amount of venture capital clearly depends on the overall size of the economy we normalize

venture capital investments by the sum of gross fixed-capital formation and business enterprise expenditures on research and development. Gross fixed-capital formation corresponds to investments into physical structures and equipment, whereas business expenditures on research and development are the most important part of intangible capital formation by small innovative start-ups. This normalization provides a useful basis from which to assess the relevance of venture capital financing and gives a comparable measure of venture capital intensity across countries varying between zero (Greece, 2005 and 2008) and 3.1 percent (United Kingdom, 2006) (cf. Table 1). On average the 19 countries in our sample have a venture capital ratio of 0.2 percent.

We measure the opportunity wage of entrepreneurs in alternative activities outside small innovative firms by the log of the net wage used to compute the denominator of the venture capital ratio. So we assume that entrepreneurs are able to achieve above-average incomes after tax if they were to work in traditional firms which is coherent with our definition of potential entrepreneurs as graduates with tertiary education. The tax rate in our application is the ratio of revenues from capital gains and corporate profits to GDP, rather than the statutory tax rate. This modification allows for the substantial scope of tax avoidance created by opportunities in the tax code to lower the tax base.

Public investment subsidies can be granted either as direct payments or as tax relief. We use the share of business expenditures on research and development (BERD) financed directly by government subsidies. This share is on average almost 8 percent and assumes substantial values for some of the countries. The USA, for example, subsidized 26.4 percent of BERD by providing public funds (1989). France financed more than 22 percent (1991). In recent years this share declined for all countries starting from high levels in the beginning of the 1990s, with Spain alone starting to increase direct research and development (R&D) subsidies after 2002. Tax relief, on the other hand, is not as easy to compute because the estimate of foregone taxes relies on assessments of the reduced tax base and the tax rate applicable to it. The OECD publishes the B-index which is equal to the after-tax cost of US Dollar 1 spent on R&D divided by one minus the corporate income tax rate. We use 1 minus the B-index as our indicator of the size of public R&D subsidies. Our sample shows considerable variation around the mean of 0.13. While for Germany and Italy the indicator of tax subsidies is negative and thus shows a tax burden rather than a subsidy, Greece had values of 1 between 1989 and 1996 indicating full public subsidization of R&D spending during this period; afterwards the Greek tax system quickly moved toward an almost neutral stance.

Industrialized countries implement several programs to foster entrepreneurship by encouraging start-ups. Keuschnigg and Nielsen (2005) propose such programs as alternative promising instruments. Data on entrepreneurship promotion is hard to come by, the closest approximation we find are public expenditures on start-up incentives for unemployed persons allocated within labor market programs. These labor market programs support the unemployed who begin a career as self-employed persons, by providing courses, for example, on management fundamentals. Continued unemployment benefits during the first phase of opening shop constitute the main part of expenditures, however, so our measure does not fully reflect start-up incentives relevant for venture capital projects. Additionally, entry liberalization has been shown by Nicoletti and Scarpetta (2003) to be positively related to

output growth while Alesina et al. (2005) provide evidence for a close connection with investment spending. We therefore use two indicators collected by the Worldbank reflecting the ease of starting a business as alternative measures for entrepreneurship promotion. First, the time to start a business measures the number of calendar days needed to complete the procedures to legally operate a business. The time needed to open a business varies markedly within our sample between 2 (Australia) and 114 (Sweden) days. Second, we use the costs of start-up as indicated by expenses needed to register a business with national authorities. The highest start-up costs are in Greece while Denmark and Ireland require minimum payments.

The number of potential entrepreneurs also determines the amount of venture capital in an economy. We use two different measures for this variable. First, we collect all graduates with tertiary education in the fields of business administration, life sciences, physical sciences, mathematics and statistics, computing, engineering and engineering trades, manufacturing and processing from the OECD data base on education and relate this quantity to the working age population. Second, we use the indicator by Barro and Lee (2010) covering persons with completed tertiary education in the population aged 20 and older. The OECD indicator is more narrowly concentrated in fields that have a closer relation to venture-capital financed projects but the data by Barro and Lee have the advantage of covering a longer period.

Although the probability of success of a specific venture is unobservable we use two variables to bring information about the aggregate business climate and therefore the average probability of success into our model. One indicator for general business conditions is the standardized business confidence indicator from the OECD's Main Economic Indicators database. This confidence indicator is comparable across countries and calculated from industrial confidence indicators based on company surveys. The OECD centers the confidence indicator at 100, which is reflected by the mean in our sample as shown in Table 1. An alternative measure for general business conditions is the insolvency ratio, measured as the number of insolvencies per 10,000 active companies. Contrary to the business confidence indicator, the insolvency ratio should be inversely related to the probability of success.

In order to achieve comparability of variables across time and countries we either work with ratios or we transform variables into real terms by dividing through the output deflator. Additionally, we transform all real values into Euros by using the year 2000 exchange rate vis-à-vis the national currency. The sample covers 19 countries (cf. Table 1 for a list of countries) and the period 1989 through 2009, though many variables are missing for some periods. As can be seen in Table 1 only corporate tax rates are available for all years, on the other hand, observations for costs of start-ups and time to start a business are particularly scarce. The resulting unbalanced panel which we can use for the regression is thus considerably shorter.

We follow Beck and Levine (2002) and use the average of the index of financial market structure in our regression model. Averaging is suggested by the stability of financial market structures within a country over time (cf. Figure 1) and by the associated loss in the precision of estimates. This has some consequences for the regression methodology. The regression

model for Y_{it} the $TN\times1$ vector of venture capital ratios to be explained by the model has the form:

$$Y_{it} = X_{it}\beta + Z_i\gamma + \alpha_i + \varepsilon_{it} \ , \tag{21}$$

where X_{it} and Z_i denote $TN\times k$ and $TN\times g$ matrices, respectively, whose subscripts indicate variation over countries (i=1,…, N) and time (t=1, …, T). Observations are ordered first by individual and then by time. As a consequence each column of Z_i has blocks of T identical entries representing constant country specific variables. The scalar k indicates the number of time varying explanatory variables in X_{it}, while g represents the number of constant explanatory variables in Z_i. The $TN\times1$ vector α_i contains country specific effects reflecting the unobservable variables of the model presented above, i. e. search and effort costs, bargaining power, and the effort level of venture capitalists in country i. The disturbance ε_{it} has a mean of zero, constant variance σ_ε^2 conditional on X_{it} and Z_i, and is assumed to be uncorrelated with the columns of X_{it}, Z_i, and α_i.

In this case we cannot use a fixed effects panel estimator to estimate γ because the constant financial market structure will be wiped out by the within-transformation. Furthermore, as our hypothesis implies a positive relation between market-based systems and the extent of venture capital, we expect a positive correlation between both variables at the country level. This correlation violates the assumption of the random effects estimators that latent country effects, α_i, be independent of both constant, Z_i, and time varying, X_{it}, explanatory variables. In this case two methods can be applied. Hausman and Taylor (1981) suggest a generalized instrumental variable estimator and Plümper and Troeger (2007) refine the two-step procedure proposed by Hsiao (1986) with a third step.

The Hausman and Taylor estimator requires a partition of both time varying, X_{it}, and constant ,Z_i, explanatory variables into exogenous and endogenous variables. Exogenous variables are assumed to be uncorrelated to latent country effects while endogenous variables are correlated with country effects. All variables in X_{it} and Z_i not being correlated with the latent country effect, α_i, serve as valid instruments for the columns of Z_i that are correlated with latent country effects, in our case the financial market structure. A necessary condition for identification of the parameter vectors β and γ is that the number of exogenous time varying variables is greater than or equal to the number of endogenous constant variables and that there is at least one constant exogenous variable in Z_i. In our case, only the financial market structure, $IFMS_i$, is related to the latent country effect while for all other variables in X_{it} we have no a priori reason to believe in any correlation. Thus the necessary condition k>1 is fulfilled. Apart from the financial market structure none of the other explanatory variables is constant over time. So we have to take the average value for at least one of the time-varying exogenous variables in equation (20) in order to achieve identification. We choose the corporate tax rate for this purpose because changes in the tax code are certainly exogenous to the latent country effect in the venture capital ratio and because the average corporate tax rate tends to be stable over time. This can also be seen by the low variation in the corporate tax rate which has one of the smallest coefficients of variation in our sample. In the following we refer to estimates based on the Hausman and Taylor estimator as HT.

The estimator suggested by Plümper and Troeger does not rely on a priori assumptions on the exogeneity of explanatory variables. Instead, they propose a three-step procedure based on the fixed-effects estimator for equation (21) excluding constant explanatory variables Z_i in the first step. From the fixed effects estimator of the first step we can derive an estimate of the latent country effect, $\hat{\alpha}_i$, which will be regressed on the constant explanatory variables in the second step:

$$\hat{\alpha}_i = Z_i\varphi + \eta_i \ . \tag{22}$$

The only interesting result from the second step regression is the residual, η_i, which will be used in the third step regression as an additional explanatory variable. The third step uses pooled OLS to estimate β and γ in equation (21) amended by η_i. In the following, we will refer to estimates based on the Plümper and Troeger estimator by PT.

Both estimators, Hausman and Taylor's as well as Plümper and Troeger's, rely on $N\rightarrow\infty$ asymptotics, which cannot be expected to hold in a cross-country sample. We therefore use bootstrapped estimators of the covariance matrix to compute the standard errors in Tables 3 and 4.

5. Results

We want to test the hypothesis whether venture capitalists are able to raise and invest more funds for seed and start-up finance in market-based financial systems. For this purpose we run a series of regressions based on model (21) employing two estimation methods that allow for a combination of time-variable and time-invariant information in the panel. Table 2 confirms that our results do not suffer from excessive multicollinearity and Tables 3 and 4 summarize our results. The latter tables show the point estimates and indicate whether they differ significantly from zero. The bottom of each table presents the number of observations, the coefficient of determination, and the p-value for a Ramsey-Reset test. We distinguish between models using the full set of explanatory variables (1, 2, 5, 6, 9, and 10) as suggested by equation (20). This approach leaves us with only 73 observations for the 19 countries. The low number of observations is mainly due to the scarcity of our two indicators on the public policy stance toward easy and low-cost registration of companies with the authorities. If we drop those two indicators we can almost double the sample size to 128 observations. Models 3, 4, 7, and 8 use the reduced variable set with a higher number of observations. The Ramsey test shows that only models 3 and 7 potentially suffer from misspecification.

The first line of Table 3 shows point estimates and significance levels for the Kunt and Levine index of financial structure. All point estimates are positive and differ significantly from zero; aside from model (4), even at the one percent level. The positive sign indicates that more market-based economies have significantly higher venture capital ratios; i. e. financing seed money and start-ups by venture capital is significantly more prevalent in market-based economies. Of the other explanatory variables only the number of potential entrepreneurs is significant across all specifications in Table 3. It is interesting to find that a higher number of potential entrepreneurs actually lowers venture capital finance for dynamic young firms. The

significantly negative sign across different specifications and estimators shows that the increase in search costs implied by a larger pool of projects weighs down the venture capital ratio. An alternative reason for this result may be the imprecise measure of potential entrepreneurs that we use. Instead of the unobservable number of potential entrepreneurs with interesting business projects we use the whole universe of graduates including those without a venture. Several other explanatory variables are significant but only for one of the two estimators, i. e. either for PT- or HT-estimators. In general the PT-estimator rejects the null hypothesis of zero for the respective parameter more often. The HT-estimator is more demanding and rejects the null hypothesis of a zero coefficient among the additional explanatory variables only in the case of the business confidence indicator. The positive sign hints at higher venture capital ratios during favorable business climates, a result also confirmed by Gompers and Lerner (1998). The PT-estimator shows a highly significant negative impact from opportunity wages and the time needed to start a business on the venture capital ratio. This is to be expected because higher wages in alternative jobs reduce the incentive to engage in risky activities with a small probability of success (Cochrane, 2005; Lerner, 2009, p. 79). On the other hand, entrepreneurship promotion and the corporate tax rate are supportive to venture capital finance, which seems reasonable with respect to promotion activities but this coefficient changes if we use the larger sample (model 3). The positive sign for the high corporate tax rate may indicate some tax avoidance, i. e. redefining investment project as tax-favored ventures, but this result is not supported by HT-estimated models. A change of sign occurs for R&D tax subsidies. The small sample provides evidence for a negative relation whereas the large sample supports a positive relation between tax subsidies and the venture capital ratio.

Overall, Table 3 provides no clear-cut evidence on the relation between policy instruments and the venture capital ratio. This might be due to an omitted interaction between the financial market structure of a country and the choice by public policymakers to implement specific economic policy instruments more or less intensively. For example, countries with predominantly bank-based financial markets may decide to compensate for the missing venture capital market by increasing their direct R&D subsidies. This would result in a negative correlation between the financial market structure and direct R&D-subsidies which in a multivariate regression may result in a false positive relation between market structure and the extent of venture capital finance due to omitted variable bias. Similarly, other policy instruments like entrepreneurship promotion and indirect tax subsidies for R&D spending could be used in the same compensatory way.

We account for possible negative correlation between financial market structure and economic policy instruments by introducing interaction terms into our regression models. For this purpose Table 4 repeats models 1 through 4 from Table 3 but adds interaction terms between the financial market structure and three policy instruments to promote venture-capital-backed finance as suggested by Keuschnigg and Nielsen (2005): tax subsidies, direct R&D subsidies, and entrepreneurship promotion. We try several versions of the HT-estimator with only the financial market index being the endogenous variable (models 6 and 8), model 9 uses additionally the three interaction terms as endogenous variables, and model 10 adds direct R&D subsidies to the list of endogenous variables for the HT-estimator. The results of

these extensions are mixed again. Whereas the HT-estimator does not reject zero coefficients on all interaction terms throughout all specifications, the PT-estimator finds significant interaction between financial market structure and entrepreneurship promotion in the small sample (model 5) but rejects it in the large sample (model 7). On the other hand, the small sample provides no evidence of any interaction between R&D subsidies in general and financial market structure, whereas the large sample shows significant interaction. In summary, the results on the significance of interaction terms are mixed. Nevertheless, our main interest lies with the coefficient for the financial market structure. Each model with significant interaction terms still has significant and positive coefficients for the financial market structure, although in model (5) the t-statistic for the entrepreneurship promotion suggests that the underlying policy instrument for the interaction is insignificant. Similarly, the F-test for the joint null hypothesis of a zero coefficient for the financial market structure and all related interaction terms remains significantly different from zero, i. e. financial structure matters even if we account for the interaction with policy measures intended to correct for missing market-based financial structures. Introduction of the interaction terms in the HT-estimated models results in a loss of significance for the financial structure, but the null hypothesis of no interaction cannot be rejected, thus suggesting that the models in Table 3 are the appropriate ones. With respect to our remaining control variables most of the results remain valid, though the significance of tax subsidies, business confidence, and entrepreneurship promotion switches sometimes in comparison to Table 3.

To summarize our regression results, after conditioning on a set of theoretically motivated variables we find clear evidence in favor of a significant and positive relation between financial market structure and the extent of venture capital finance throughout industrial countries. More market-based economies tend to have a higher degree of venture-capital-financed investments. With respect to economic policy variables fostering R&D expenditures and entrepreneurship promotion, on the other hand, we cannot provide conclusive results for a positive relation with venture capital finance. The following section provides a sensitivity analysis of our results.

5.1 Sensitivity Analysis

In order to check the robustness of our results we change the regression model in various dimensions. First we manipulate the set of explanatory variables. We replace our indicator of the number of potential entrepreneurs from the OECD definition to the data on educational attainment collected by Barro and Lee (2010). Although graduates in science provide a good indicator of the number of potential entrepreneurs for venture deals, data availability for this variable reduces the number of observations considerably. Additionally, Becker and Hellmann (2005) emphasize that a large number of graduates in and of itself does not imply a large potential for venture deals because it is high-quality entrepreneurs and entrepreneurial incentives that actually determine the number of potential projects. We cannot account for variations in entrepreneurial quality by using the Barro and Lee definition of educational attainment, nevertheless, our results with respect to a positive and significant relation between financial market structure and venture capital use for seed and start-up finance hold up. Only model 4 in Table 3 shows a switch toward insignificance of the financial market structure; on

the other hand, in model 10 of Table 4 financial structure becomes significant. Another variation is motivated by the crucial assumption in the theoretical model that all additional income will be spent only on traditional goods. For this reason demand for goods produced by venture-capital-financed firms does not respond to income fluctuations. Since the original model for production with monopolistic competition and product diversity by Dixit and Stiglitz (1977) was more general and allowed for a feedback between the demand for differentiated goods and income, we add the growth rate of gross national product to the set of explanatory variables. Output may also work as a demand-side indicator for project finance, which is strongly confirmed by Gompers and Lerner (1998). Adding output to the regression, however, lowers the p-value for the financial market structure in model 4 to below 5 percent, whereas significance levels in the other models remain unaffected. A possible objection to Hausman and Taylor's approach is the need to specify exogenous variables for identification. Chatelain and Ralf (2010) suggest a pretest to check whether those exogeneity assumptions are fulfilled. Accordingly, we use the Mundlak (1978) estimator to check for the exogeneity of our instrument in models 2, 4, 6 and 8: the corporate tax rate. The relevant p-values for bootstrapped t-statistics are in a range between 0.80 and 0.98 indicating that the average corporate tax rate is an appropriate instrument for the financial market structure. The resulting second stage Hausman and Taylor estimators and their bootstrapped standard deviations are almost identical to those presented in Tables 3 and 4.

As shown in Figure 1 the financial market structure develops slowly over time. In our base model we therefore use the average level of the Demirguc-Kunt and Levine (1999) financial market structure index from 1989 through 2008. Nevertheless, countries moved slowly toward a more market-based system and we are able to replace the constant average value for the financial market structure index by underlying yearly values. This perturbation also allows us to use more conventional panel estimation techniques like fixed- and random-effects models, although these estimators clearly suffer from low variation of explanatory variables in the time dimension. Because the variance of the individual mean corrected variable is small, the estimate of β is less precise, (cf. also Plümper and Troeger (2007) for Monte Carlo evidence of the bad small sample properties in the case of variables that have only small variation over time). Our conclusions drawn from Table 3 are confirmed by this variation with offsetting switches in significance: in models 5 and 7 the financial market structure becomes insignificant; in models 6 and 8, however, the p-value becomes significant.

Another modification refers to the idea that market- and bank-based finance is complementary rather than competitive as stressed by Song and Thakor (2010). The financial market structure index by Demirguc-Kunt and Levine has an intrinsic competitive interpretation of market- versus bank-based finance, as more stock market activity induces a higher value of the index and vice versa for more bank-based finance. In the case of complementary financial markets, the positive and significant value of the financial market structure index in Tables 3 and 4 may merely reflect this complementary relation rather than a positive feedback between predominantly market-based finance and the extent of venture capital investment. We therefore include an index of complementary financial markets into our regression which we base on the components already used by Demirguc-Kunt and Levine (1999), but our index increases if market- and bank-based finance is of equal importance and if the degree of

external financing is high, cf. the appendix for details of construction. Although our index of complementary financial markets is significant in some cases, the original financial market structure index by Demirguc-Kunt and Levine remains significant in those cases, further supporting our hypothesis that venture capital thrives within market-based financial systems.

Finally, we eliminate all explanatory variables from the model apart from the financial market structure index and estimate this model by using the between estimator to resemble the visual impression already provided by Figure 2. Dropping all other variables greatly increases the number of available observations toward 278 but leaves the financial structure index firmly significant at the 1-percent level.

The second dimension of our sensitivity analysis refers to characteristics of the errors. We use the ratio of seed and start-up venture capital to investments into tangible and intangible capital. Since this ratio is bounded between zero and one the corresponding regression error cannot be normally distributed. For this reason we apply a logit transformation to the venture capital ratio which expands the domain of the dependent variable from [0, 1] to [-∞, +∞] and thus theoretically allows for disturbances from the full domain of the normal distribution. We do not expect to achieve fundamentally different results from this step because standard errors in Tables 3 and 4 are already computed by bootstrap methods. Actually, our conclusion on the significance of the financial structure index does not change in any of the models. As a second variation in our endogenous variable we use GDP as the denominator to compute the venture capital ratio instead of our combined investments into tangible and intangible capital. This resembles the more common normalization for international comparisons of venture capital activity. Again our results with respect to the significance of the financial structure remain unchanged. Another potential source of wrong inference is outliers in the data. Figure 2 shows that Canada has the highest venture capital ratio, exceeding even the US value by about 50 percent. This surprisingly high value might be due to errors in data collection and may bias our estimates but, after eliminating Canada from the sample, our conclusion remains the same. A further step in this direction would be to eliminate the USA as well from the sample, because the US venture capital market is exceptional and may bias our results toward a significant positive relation between venture capital finance and market-based financial systems. Figure 2 already points to this possibility. But, even after eliminating North American data from the sample, our financial structure index remains significantly positive, in most of the models at the 1-percent level. Finally, we also use asymptotic standard errors for the computation of test statistics and our results are again confirmed without exception.

6. Conclusions

In this paper we study the relation between financial market structure and the extent of venture capital activity in the seed and start-up phase. The literature suggests two channels for a positive relation between market-based financial systems and venture capital investment. Allen and Gale (1999) stress the advantage of financial markets over bank-based systems in aggregating diverse opinions on the same information set. As the future of young innovative firms is highly uncertain, market-based systems are better at aggregating the spectrum of the investors' subjective expectations about the business development of an innovative firm.

Black and Gilson (1998) emphasize the transfer of control rights between entrepreneurs and venture capitalists. By accepting finance and advice from the venture capitalist, entrepreneurs usually transfer control rights to the venture capitalist. Fixing an initial public offering (IPO) as the preferred route of exit already in the venture capital contract allows both parties to create an implicit contract about the eventual return of control rights to the entrepreneur. Additionally, the venture capitalist's reputation acts as a positive signal for potential investors. Megginson and Weiss (1990) show that US venture capitalists actually keep a majority of their share holdings in the post-IPO period in order to send this signal. Norbäck and Persson (2009), on the other hand, suggest that venture capitalists are able to extract rents from incumbent oligopolists by supporting innovative projects that put the oligopoly rent at risk. This strategy, however, uses acquisitions by the incumbent oligopolist as the mode of exit and does not necessarily need well-functioning financial markets.

Our results confirm previous anecdotal evidence collected by Black and Gilson (1998) and a cross-country comparison by Jeng and Wells (2000). We use a set of comparable data for a sample of 19 countries and we are able to prove that market-based systems are more conducive to venture capital. Specifically, we estimate a series of panel regressions and find a significant contribution of the Demirguc-Kunt and Levine (1999) financial market structure index in explaining differences across countries with respect to venture capital investment: market-based economies show, on average, significantly higher venture capital investment. Interestingly, adding other potential determinants for the extent of venture capital as suggested by economic theory substantiates our result.

The positive relation between market-based financial systems and venture capital investment raises important policy issues. Our findings support policy recommendations formulated by Lerner (2009) with respect to creating or improving local public stock markets for young firms. Well-functioning public markets improve the possibilities to exit from an investment, which in turn allows entrepreneurs to regain their highly valued independence from venture capitalists. It also allows venture capitalists and investors alike to realize capital gains from a venture. Affecting both sides of the market at the same time, public markets increase the probability of deals in the beginning and thus back up a virtuous circle. Our results support the conjecture that implementing and enhancing public markets at the local level is an important policy challenge. The route to take innovative young firms public on major international stock markets like London or NASDAQ, as proposed by Black and Gilson (1998) as an alternative to liquid local markets, is subject to several barriers. Advanced and liquid markets have higher regulatory standards, may ask for different book-keeping rules, and foremost widen the already existing informational asymmetry between investors and entrepreneurs by using different national judicial systems, languages and so on. Feldstein and Horioka (1980) and French and Poterba (1991) show that even less risky aggregates like gross fixed capital formation and equity investments are subject to cross-border barriers (home equity bias). This phenomenon will be more pronounced for innovative young venture investments.

A further argument in favor of local markets arises from a strategic interaction perspective. The European Association of Securities Dealers Automated Quotation (Easdaq) was launched

in 1994 as a pan-European public market for young and growing companies. But EASDAQ was never able to establish a liquid and efficient market for high technology firms. Only a few dozen firms were listed on the exchange until 2003, when it was closed (Lerner, 1995B). This failure was due in part to the general start-up problems of financial markets: at the beginning only a few firms are listed on a stock market and the transaction volume is small. The high degree of illiquidity deters other firms from listing and a deadlock may set in if the exchange is unable to attract more companies to list. A more relevant cause for the failure of EASDAQ was the fierce competition from local exchanges that set in after the foundation of EASDAQ. Equity markets for young and small firms sprang up at the national level in France (1996: Nouveau Marché), Germany (1997: Neuer Markt), Italy (1999: Nuovo Mercato), and Spain (2000: Nuevo Mercado) among others. The stated goal of these 'new markets' was to facilitate the access of small- and medium-sized firms to an equity market but essentially it was a strategic move on the part of local exchanges to avoid losing the lucrative domestic market of potentially very successful IPOs to EASDAQ.

Although many of the new markets already ceased to exist they improved the possibilities for IPOs of young and innovative firms at second-tier segments of local exchanges and thus enhanced the general conditions for future venture capital investments. Becker and Hellman (2005) argue that establishing a well-functioning stock market requires a number of additional institutional changes that go beyond founding a new special market segment or a stock exchange. For instance, if the prospective venture capitalists face difficulty in acquiring control rights in the first place, the ease of exit offered by a stock market will not, by itself, make the market attractive. On the other hand, the media coverage of successful firms listed on the Neuer Markt in Germany improved the general attitude toward entrepreneurship in Germany (Becker and Hellman, 2005) and thus also had positive secondary effects.

To sum up, although well-developed domestic stock markets for young and innovative firms are not a sufficient condition for a successful venture capital industry, they are significantly and positively related to venture capital activity. We conclude from our empirical results that creating vibrant local stock markets for publicly traded firms produces favorable conditions for venture-capital financed seed and start-up investments.

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References

Alesina, A., Ardagna, S., Nicoletti, G., Schiantarelli, F., (2005), Regulation and Investment, *Journal of the European Economic Association*, 3(4), 791-825.

Allen, F., (1993), Stock Markets and Resource Allocation, in Mayer, C., Vives, X., eds. *Capital Markets and Financial Intermediation*, CEPR conference volume, Cambridge University Press Cambridge, 81-108.

Allen, F., Gale, D., (1999), Diversity of Opinion and Financing new Technologies, *Journal of Financial Intermediation, 8, 68-89.*

Allen, F., Gale, D., (2000), *Comparing Financial Systems*, MIT-Press, Cambridge MA.

Barro, R., J., Lee, J.-W., (2010), A New Data Set of Educational Attainment in the World, 1950–2010, NBER Working Paper Series No. 15902, National Bureau of Economic Research, Cambridge MA.

Beck, T., Demirgüc-Kunt, A, Levine, R., (2000), A New Database on Financial Development and Structure, *World Bank Economic Review* 14, 597-605.

Beck, T., Levine, R., (2002), Industry Growth and Capital Allocation: Does Having a Market- or Bank-Based System Matter?, *Journal of Financial Economics*, 64, 147-180.

Beck, T., Levine, R., (2004), Stock Markets, Banks, and Growth: Panel Evidence, *Journal of Banking and Finance*, 28(3), 423-442.

Becker, R., M., Hellmann, T., F., (2005), The Genesis of Venture Capital - Lessons from the German Experience, in Kanniainen, V., Keuschnigg, C., eds, *Venture Capital, Entrepreneurship, and Public Policy*, CESifo Seminar Series vol. 9, MIT-Press, Cambridge MA, 33-67.

Black, S., B., Gilson, J., R., (1998), Venture Capital and the Structure of Financial Markets: Bank Versus Stocks Markets, *Journal of Financial Economics*, 47, 243-277.

Brown, J., R., Fazzari, S., M., Petersen, B., C., (2009), Financing Innovation and Growth: Cash Flow, External Equity, and the 1990s R&D Boom, *Journal of Finance*, 64(1), 151-185.

Bruno, G., De Bonis R., (2009), Do Financial Systems Converge? New Evidence from Household Financial Assets in Selected OECD Countries, OECD Statistics Working Papers 2009/1, OECD, Statistics Directorate, Paris.

Chatelain J-B., Ralf K., (2010), Inference on Time-Invariant Variables using Panel Data: A Pre-Test Estimator with an Application to the Returns to Schooling, Université Paris 1 Panthéon-Sorbonne (Post-Print and Working Papers) hal-00492039_v1, HAL.

Cochrane, J., H., (2005), The Risk and Return of Venture Capital, *Journal of Financial Economics*, 75, 3-52.

Demirguc-Kunt, A., Levine, R., (1999), Bank-Based and Market-Based Financial Systems - Cross-Country Comparisons, Policy Research Working Paper Series 2143, World Bank, Washington D.C.

Diamond, D., (1984), Financial Intermediation and Delegated Monitoring, *Review of Economic Studies*, 51, 393-414.

Dixit, A., K., Stiglitz, J., E., (1977), Monopolistic Competition and Optimum Product Diversity, *American Economic Review*, 67(3), 297-308.

Feldstein, M., Horioka, C., (1980), Domestic Saving and International Capital Flows, *The Economic Journal*, 90, 314–329.

French, K., Poterba, J., (1991), Investor Diversification and International Equity Markets, *American Economic Review*, 81(2), 222–226.

Gompers, P., A., (1995), Optimal Investment, Monitoring, and the Staging of Venture Capital, *Journal of Finance*, 50, 1461-1490.

Gompers, P., A., Lerner, J., (1998), What Drives Venture Capital Finance, *Brookings Papers on Economic Activity*, Microeconomics, 142-192.

Hahn, F., R., (2008), The Finance-Specialization-Growth Nexus: Evidence From OECD Countries, *Applied Financial Economics*, 18, 255-265.

Hall, B., H., (2002), The Financing of Research and Development, *Oxford Review of Economic Policy*, 18(1), 35-51.

Hart, O., Moore, J., A (1994), A Theory of Debt Based on the Inalienability of Human Capital, *Quarterly Journal of Economics*, 109, 841-879.

Hausman, J., A., Taylor, W., E., (1981) Panel Data and Unobservable Individual Effects, *Econometrica*, 49(6), 1377-1398.

Houben, A., Kakes, J., (2002), ICT Innovation and Economic Performance: The Role of Financial Intermediation, *Kyklos*, 55, 543-562.

Hsiao, C., (1986), *Analysis of Panel Data*, Cambridge University Press, Cambridge.

Jeng, L., A., Wells, P., C., (2000), The Determinants of Venture Capital Funding: Evidence Across Countries, *Journal of Corporate Finance*, 6(3), 241-289.

Kaplan, S., N., Strömberg, P., (2003), Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts, *Review of Economic Studies*, 70, 281-315.

Keuschnigg, C., Nielsen, S., B., (2005), Public Policy for Start-up Entrepreneurship with Venture Capital and Bank Finance, in Kanniainen, V., Keuschnigg, C., eds, *Venture Capital, Entrepreneurship, and Public Policy*, CESifo Seminar Series vol. 9, MIT-Press, Cambridge MA, 221-250.

Kortum, S., Lerner, J., (1998), Stronger Protection or Technological Revolution: What is Behind the Recent Surge on Patenting?, Carnegie Rochester Conference Series on Public Policy, 48, 247-304.

Kunt, A., Levine, R., (2004*), Financial structure and economic growth - A Cross Country Comparison of Banks, Markets, and Development*, MIT Press, Cambridge MA.

Lerner, J., (1995A), Venture Capitalists and the Oversight of Private Firms, *Journal of Finance*, 50, 301-318.

Lerner, J., (1995B), European Association of Securities Dealers: November 1994, Harvard Business School Case no. 9-295-116.

Lerner J., (2009), *Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed – and What to Do About It*, Princeton University Press, Princeton NJ.

Lumme, A., Kauranen, I., Autio, E., (1994) The Growth and Funding Mechanism of New, Technology-Based Companies: A Comparative Study Between the United Kingdom and Finland, *Finnish Journal of Business Economics*, 43(1), 20-35.

Martinsson, G., (2010), Equity Financing and Innovation: Is Europe Different from the United States?, *Journal of Banking and Finance*, 34(6), 1215-1224.

Megginson L., W., Weiss A., K., (1990), Venture Capital Certification in Initial Public Offerings, *Journal of Finance*, 46(3), 879-903.

Michie, R., (1987), The London and the New York Stock Exchanges 1850-1914, *Allen and Unwin*, London.

Mundlak, Y., (1978) On the Pooling of Time Series Data and Cross-Section Data, *Econometrica*, 46, S. 69-85.

Nicoletti, G., Scarpetta, S., (2003), Regulation, Productivity, and Growth: OECD Evidence, *European Economy*, No. 36, 9-69.

Norbäck, P.-J., Persson, L., (2009), The Organization of the Innovation Industry: Entrepreneurs, Venture Capitals, and Oligopolists, *Journal of the European Economic Association*, 7(6), 1261-1290

Plümper T., Troeger V., E., (2007), Efficient Estimation of Time-Invariant and Rarely Changing Variables in Finite Sample Panel Analyses with Unit Fixed Effects, *Political Analysis*, 15(2), 124-139.

Song, F. and Thakor, A. V. (2010), Financial System Architecture and the Co-evolution of Banks and Capital Markets, *Economic Journal*, 120, 1021-1055.

Table 1: List of variables and sample descriptive statistics

	Observations	Mean	Standard Deviation	Minimum	Maximum
Venture capital ratio	267	0.002	0.003	0.000	0.031
Financial market structure	361	0.000	0.368	-0.423	1.195
Potential entrepreneurs	172	0.004	0.002	0.000	0.009
Insolvencies	266	90.353	63.482	1.112	299.000
Cost of start-up	114	6.167	7.012	0.000	32.000
Tax subsidies	379	0.126	0.210	-0.054	1.000
Direct R&D subsidies	300	7.936	4.431	1.237	26.396
Business Confidence	380	99.885	2.865	87.100	105.800
Wages	367	-3.858	0.415	-5.023	-2.875
Time to start business	114	20.702	19.573	2.000	114.000
Entrepreneurship promotion	357	118.189	307.997	0.000	2752.960
Corporate tax rate	399	3.052	1.076	1.527	6.667

Notes: Data available as an incomplete panel for 19 countries over 1989 through 2008. The countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the USA. For sources and definition of variables see Table A1.

Table 2: Correlations across variables

	Venture capital ratio	Wages	Corporate tax rate	Cost of start-up	Time to start business	Business Confi-dence	Direct R&D subsidies	Financial market structure	Tax subsidies	Insol-vencies	Potential entre-preneurs	Entrepre-neurship promotion
Venture capital ratio	1.00											
Wages	0.20	1.00										
Corporate tax rate	-0.07	0.44	1.00									
Cost of start-up	-0.26	-0.37	-0.14	1.00								
Time to start business	-0.12	-0.33	-0.27	0.27	1.00							
Business Confidence	-0.14	0.02	0.30	-0.05	-0.11	1.00						
Direct R&D subsidies	-0.04	-0.07	0.08	0.34	0.12	0.17	1.00					
Financial market structure	0.19	0.20	-0.10	-0.37	-0.03	-0.07	0.01	1.00				
Tax subsidies	-0.02	-0.09	0.24	0.26	-0.10	0.03	0.53	-0.20	1.00			
Insolvencies	-0.11	0.06	-0.19	-0.37	0.28	0.08	-0.06	-0.13	-0.42	1.00		
Potential entrepreneurs	0.22	0.07	0.13	-0.44	-0.36	-0.11	-0.22	0.28	-0.07	-0.22	1.00	
Entrepreneurship promotion	-0.13	-0.10	-0.29	0.19	0.15	0.07	0.06	-0.26	-0.08	0.02	-0.33	1.00

S: Own calculations.

Table 3: Venture capital finance and financial market structure - Regression results

	Dependent variable: Venture capital ratio			
Model	1	2	3	4
	PT	HT	PT	HT
Financial Market Structure	0.0036 ***	0.0054 ***	0.0065 ***	0.0111 ***
Potential entrepreneurs	-0.4690 ***	-0.4380 *	-0.8020 ***	-0.8040 **
Insolvencies[1])	-0.0021	0.0014	0.0145	-0.0084
Cost of start-up[1])	-0.1060	-0.1650	-	-
Tax subsidies	-0.0009 *	-0.0008	0.0039 **	0.0038
Direct R&D subsidies[1])	0.1700	0.0868	-1.8800 **	-1.6800
Business Confidence[1])	-0.4760	-0.6190	1.5300 *	1.3600 **
Wages	-0.0046 ***	-0.0028	-0.0067 ***	-0.0034
Time to start business[1])	-0.0746 ***	-0.0785	-	-
Entrepreneurship promotion[1])	0.0027 **	0.0033	-0.0113 ***	-0.0093
Corporate Tax Rate	0.0009 ***	0.0006	0.0009 ***	0.0006
Eta	1.0000 ***	-	1.0000 ***	-
Constant	-0.0115 ***	-0.0026	-0.0371 ***	-0.0221 *
Observations	73	73	128	128
Ramsey test p-value	0.48	0.33	0.59	0.90
R-squared	0.92	-	0.50	-

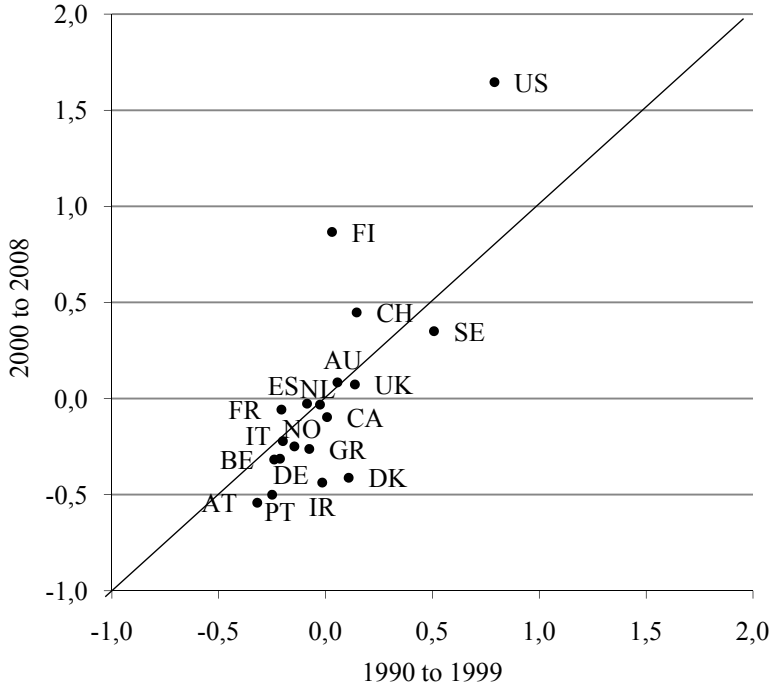
Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Eta is the residual from the second stage regression in the PT procedure. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table 4: Venture capital finance and financial market structure - Regression results with policy interaction terms

	Dependent variable: Venture capital ratio					
Model	5	6	7	8	9	10
	PT	HT	PT	HT	HT	HT
Financial Market Structure	0.0029 ***	0.0009	0.0094 ***	0.0064	0.0047	0.0049
Potential entrepreneurs	-0.4740 ***	-0.4020 *	-0.7860 ***	-0.7280 *	-0.4420 *	-0.4480 **
Insolvencies[1])	0.0034	0.0018	0.0203	-0.0140	0.0089	0.0081
Cost of start-up[1])	-0.1260	-0.3230	-	-	-0.2260	-0.2070
Tax subsidies	-0.0003	0.0012	0.0137 ***	0.0109 **	0.0011	0.0008
Direct R&D subsidies[1])	0.3410	0.3450	-2.7600 **	-1.3500	0.1120	0.2370
Business Confidence[1])	-0.4570	-0.7180	1.6600 *	1.3100	-0.6080	-0.5760
Wages	-0.0049 ***	-0.0019	-0.0093 ***	-0.0026	-0.0030	-0.0032
Time to start business[1])	-0.0966 ***	-0.0873	-	-	-0.1040	-0.1020
Entrepreneurship promotion[1])	-0.0059	-0.0022	0.0196	-0.0194	-0.0045	-0.0052
Interaction with tax subs.	0.0024	0.0090	0.0503 ***	0.0434	0.0078	0.0068
Interaction with R&D subs.[1])	0.7920	1.1400	-5.7900 ***	-4.0200	0.5280	0.7200
Interaction with promotion[1])	-0.0373	-0.0195	0.1200	-0.0367	-0.0332	-0.0359
Corporate Tax Rate	0.0009 ***	0.0004	0.0011 ***	0.0002	0.0007	0.0007
Eta	1.0000 ***	-	1.0000 ***	-	-	-
Constant	-0.0130 ***	0.0023	-0.0493 ***	-0.0178	-0.0038	-0.0047
Observations	73	73	128	128	73	73
Ramsey test p-value	0.54	0.89	0.00	0.43	0.14	0.13
R-squared	0.92	-	0.52	-	-	-

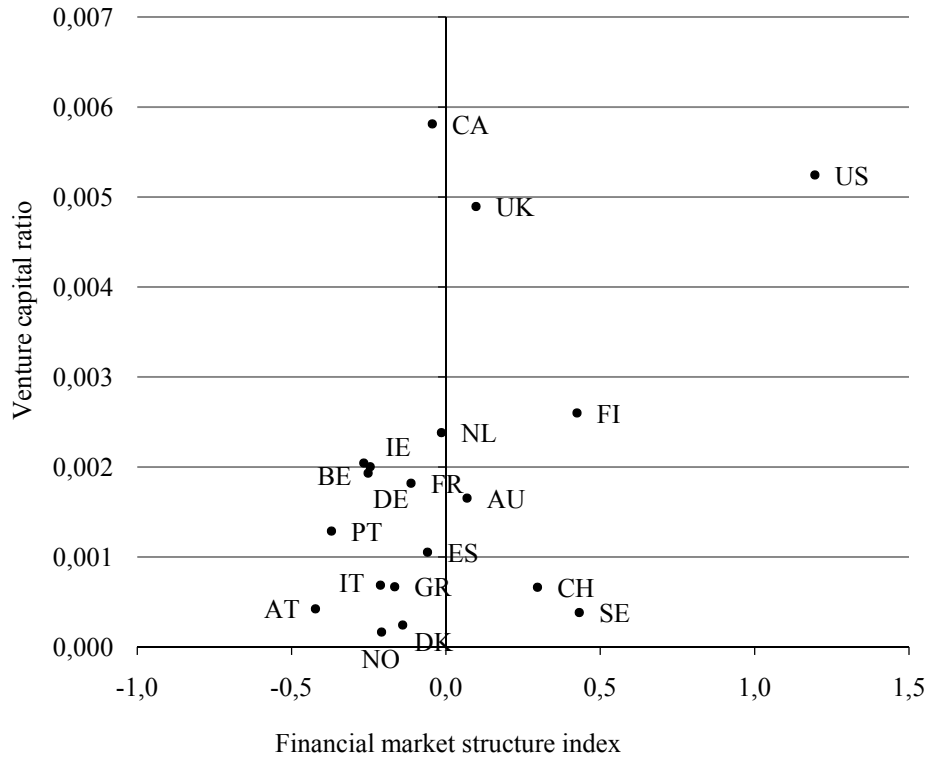
Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Eta is the residual from the second stage regression in the PT procedure. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Figure 1: Financial market structure index during the 1990s and 2000s



S: Own computations according to Demirguç-Kunt and Levine (1999) with current Worldbank data from "A New Database on Financial Development and Structure" (Beck, Demirguç-Kunt and Levine, 2000). Dots show average values over the periods given on the respective axis. Dots above the 45-degree line indicate a development toward a more market-based financial system whereas dots below the 45 degree line show a movement toward a more bank-based system.

Figure 2: The extent of venture capital finance and financial market structure



Notes: The venture capital ratio is venture capital investments into seed and start-up projects over tangible and intangible capital formation. The financial market structure index by Demirguç -Kunt and Levine (1999) increases with the extent of market-based financial transactions. Dots show average values from 1990 through 2008.

Appendix: Construction of the index of complementary financial markets and data sources:

The measure for financial market structure suggested by Demirguc-Kunt and Levine (1999) is a continuous number increasing in the extent of market-based finance of domestic firms. The index compares the level of financial activity channeled through the stock market to that facilitated by private banks. The index combines deposits at banks, DB, private credit by banks, PCB, overhead costs of banks, OCB, the stock market capitalization, SMC, and the stock market total traded value, SMT, into an index number. The first two components of the index are the ratio of the stock market capitalization to deposits at banks, A_{it}, and the ratio of the stock market total traded value to private credit by banks, B_{it}:

$$A_{it} = \frac{SMC_{it}}{DB_{it}} \qquad B_{it} = \frac{SMT_{it}}{PCB_{it}}.$$

Both components are computed for each country i and year t. Furthermore, Demirguc-Kunt and Levine (1999) use the ratio of bank overhead costs to total assets of banks and multiply it by the stock market total traded value to GDP ratio to compute the third component, C_{it}:

$$C_{it} = \frac{OCB_{it}}{TAB_{it}} \frac{SMT_{it}}{GDP_{it}}.$$

Then all three components, A_{it}, B_{it}, and C_{it} are mean corrected by subtracting the mean over all countries and years, cf. in the case of the stock market capitalization to deposit at banks ratio we obtain:

$$a_{it} = \left(A_{it} - A_{..}\right),$$

where $A_{..}$ represent the mean of A_{it} across countries and years. Finally, the index of financial market structure, $IFMS_{it}$, is computed as the average of the three components:

$$IFMS_{it} = \left(a_{it} + b_{it} + c_{it}\right)/3.$$

A higher value of this index clearly indicates a higher degree of market-based finance for country i. In order to obtain a measure of complementary financial markets we rearrange the first two components of the index by Demirgurc-Kunt and Levine such that those components increase if marked and bank-based characteristics within a country are balanced. Specifically, we compute products rather than ratios between marked- and bank-based variables and normalize all variables with respect to GDP to make numbers comparable across countries:

$$A^*_{it} = \frac{DB_{it}}{GDP_{it}} \frac{SMC_{it}}{GDP_{it}} \qquad B^*_{it} = \frac{PCB_{it}}{GDP_{it}} \frac{SMT_{it}}{GDP_{it}}$$

The modified ratios achieve a maximum value if market- and bank based finance are of equal size, reflecting the idea of complementary rather than competitive financial markets. The third indicator, C_{it}, does not have a similar reinterpretation; we therefore take C_{it} as in Demirguc-Kunt and Levine. Again we subtract means across countries and years from the modified components, making the index of complementary finance, IC_{it}, increasing in the size of financial markets within country i relative to the sample average:

$$IC_{it} = \left(a^*_{it} + b^*_{it} + c_{it}\right)/3.$$

We use the current release of the World Bank dataset to compute our index of complementary financial markets.

Table A1: Description and source of variables

Full name	Source and links	Description
Business confidence	OECD-Monthly Economic Indicators http://stats.oecd.org/	Confidence indicator based on industrial confidence surveys
Corporate tax rate	OECD, Revenue Statistics, comparative table database http://stats.oecd.org/Index.aspx?DataSetCode=REV	Revenue of taxes on capital gains and corporate profits as percentage of GDP.
Cost of start-up	World Bank, Doing Business project http://www.doingbusiness.org/	Cost to register a business normalized as a percentage of gross national income (GNI) per capita.
Direct R&D subsidies	OECD, Main Science and Technology Indicators http://stats.oecd.org/	Percentage of business expenditures on R&D financed by government.
Entrepreneurship promotion	OECD Labor market Programs database http://stats.oecd.org/OECDStat_Metadata/ShowMetadata.ashx?Dataset=LMPEXP&ShowOnWeb=true&Lang=en	Programs promoting entrepreneurship by encouraging the unemployed and target groups to start their own business or to become self-employed. "Most measures take the form of continued payment of unemployment benefit during the start-up of a business". Management support with various definitions in the different countries, Eurostat LMP publication, p24-75. In millions of Euros, real. For non-Euro-members at constant exchange rates from year 2000.
Financial market structure	World Bank "A new Database on Financial Development and Structure" http://go.worldbank.org/X23UD9QUX0	Index developed by Demirguc-Kunt and Levine (1999) to separate bank- and market-based economies. Own computation by following Demirguc-Kunt and Levine's methodology for the period 1990 to 2008.
Gross domestic product	OECD, Main Economic Indicators http://stats.oecd.org/OECDStat_Metadata/ShowMetadata.ashx?Dataset=REFSERIES&Coords=[SUBJECT].[GDPA]&ShowOnWeb=true&Lang=en	Logarithm of gross domestic product (expenditure approach), in millions of Euros, real, for non-Euro-members at constant exchange rates from year 2000.
Investment spending	Eurostat, OECD Annual National http://epp.eurostat.ec.europa.eu/, http://stats.oecd.org/.	Gross fixed capital formation, i.e. investment into structures and equipment. In millions of national currency.
Insolvencies	Australia: Insolvency and Trustee Service Australia, Canada: Office of the Superintendent of Bankruptcy, Europe: Creditreform, USA: American Bankruptcy Institute. CreditReform http://www.creditreform.de/Deutsch/Creditreform/Presse/Creditreform_Wirtschaftsforschung/Insolvenzen_in_Europa/ http://www.abiworld.org/AM/Template.cfm?Section=Business_Bankruptcy_Filings1&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=59&ContentID=36301 Office of the Superintendent of Bankruptcy Canada, http://www.ic.gc.ca/eic/site/bsf- http://www.itsa.gov.au/dir228/itsaweb.nsf//docindex/about+us-%3Epublications-%3Eannual+reports	Insolvency ratios, number of insolvencies per 10,000 companies. US: American bankruptcy Institute: US bankruptcy fillings (1980-2009), number of bankruptcy divided by the number of business firms (multiplied by 10,000, own computation). Australia: Annual report by the Inspection General in bankruptcy on the operation of the bankruptcy Act 2008, p15. absolute value divided by the number of Australian firms multiplied by 10,000 (own computation).

Table A1 – Description and sources of variables, continued

GDP deflator	OECD Economic Outlook No 86: Annual and Quarterly data	National accounts deflator for gross domestic product.
Population, total	US Census Bureau, International http://www.census.gov/ipc/www/idb/groups.php	Number of males and females aged between 20 to 64 years, in millions.
Potential entrepreneurs, OECD	OECD Education and Training http://stats.oecd.org/Index.aspx?DataSetCode=RGRADSTY	Graduates with tertiary education in business administration, life sciences, physical sciences, mathematics and statistics, computing, engineering and engineering trades, manufacturing and processing. In millions.
Potential entrepreneurs, share OECD	Own computation based on OECD measure	Number of potential entrepreneurs (tertiary graduates) divided by total population aged 20 to 64.
Potential entrepreneurs, Barro-Lee	Barro and Lee (2010) educational attainment dataset by 5 year age group, http://www.barrolee.com/	Number of persons with completed tertiary education in age groups 25 and older.
Potential entrepreneurs, share Barro - Lee	Own computation based on Barro and Lee (2010) measure.	Number of potential entrepreneurs (tertiary graduates) divided by total population aged 20 to 64.
Tax subsidies	OECD http://www.oecd.org/sti/scoreboard/	Various scoreboards (STI). The B index is equal to the after-tax cost of USD 1 spend on R&D divided by one minus the corporate income tax rate. We use 1 minus the B-index as the indicator.
Time to start business	World Bank, Doing Business project http://www.doingbusiness.org/	Time required to start a business is the number of calendar days needed to complete the procedures to legally operate a business. If a procedure can be speeded up at additional cost, the fastest procedure, independent of cost, is chosen.
Venture capital deals	AVCAL, CVCA, EVCA, and NVCA (various yearbooks)[1])	Number of the Venture Capital seed and start-up deals signed. In millions.
Venture capital investments	AVCAL, CVCA, EVCA, and NVCA (various yearbooks)[1])	Amount of venture capital invested for seed money and start-ups. Real value, in millions of Euros (year 2000).
Venture capital ratio	Own computation	Numerator: Amount of venture capital seed and start-up investments, denominator: Gross fixed capital formation amended by entrepreneur's wage (number of venture capital deals times the average wage, see above).
Wages	OECD Tax Database, Table 1-5. www.oecd.org/ctp/taxdatabase/	Logarithm of net per capita wage for earners receiving 133% of the average wage (after social security contributions and income tax). In millions of Euros. For non-Euro-members at constant exchange rates from year 2000.

Notes: 1) National venture capital associations of Australia, Canada, Europe und the USA. Real values are computed by applying GDP-deflators.

Table A2: Venture capital finance and financial market structure - Regression results with an alternative measure for potential entrepreneurs

	Dependent variable: Venture capital ratio			
Model	1	2	3	4
	PT	HT	PT	HT
Potential entrepreneurs	-0.0189 ***	-0.0172	0.0144 ***	0.0059
	(0.0000)	*(0.1820)*	*(0.0025)*	*(0.8460)*
Insolvencies[1])	-0.0071	-0.0044	-0.1030 ***	-0.1170 *
	(0.6170)	*(0.8490)*	*(0.0008)*	*(0.0960)*
Cost of start-up[1])	0.2660 **	0.2150	-	-
	(0.0442)	*(0.7500)*	-	-
Tax subsidies	-0.0017 ***	-0.0015	0.0009	0.0016
	(0.0054)	*(0.2580)*	*(0.4850)*	*(0.5800)*
Direct R&D subsidies	0.0001 ***	0.0001	-0.0002 ***	-0.0002
	(0.0000)	*(0.3180)*	*(0.0008)*	*(0.1650)*
Business Confidence[1])	-0.3860	-0.5070	-0.5770	-0.6790
	(0.1960)	*(0.2990)*	*(0.6040)*	*(0.4720)*
Wages	-0.0038 ***	-0.0026	-0.0009	0.0010
	(0.0000)	*(0.3090)*	*(0.1250)*	*(0.8540)*
Time to start business[1])	-0.0817 ***	-0.0815	-	-
	(0.0009)	*(0.2550)*	-	-
Entrepreneurship promotion[1])	0.0034 ***	0.0041	-0.0082 **	-0.0075
	(0.0025)	*(0.6950)*	*(0.0327)*	*(0.6100)*
Financial Market Structure	0.0045 ***	0.0072 *	0.0013 *	0.0027
	(0.0000)	*(0.0710)*	*(0.0558)*	*(0.7560)*
Corporate Tax Rate	0.0007 ***	0.0006	-0.0003 **	-0.0005
	(0.0000)	*(0.5530)*	*(0.0413)*	*(0.7330)*
Eta	1.0000 ***	-	1.0010 ***	-
	(0.0000)	-	*(0.0000)*	-
Constant	-0.0077 **	-0.0017	0.0055	0.0156
	(0.0147)	*(0.8760)*	*(0.6300)*	*(0.5150)*
Observations	75	75	168	168
R-squared	0.92	-	0.45	-
Number of countries	-	19	-	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Potential Entrepreneurs in Tables 3 and 4 are tertiary graduates in basic sciences. Barro and Lee (2010) provide number for tertiary students in arts, business administration, and sciences. The period covered by Barro and Lee is longer and allows higher degrees of freedom. 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A3: Venture capital finance and financial market structure - Regression results with policy interactions and an alternative measure for potential entrepreneurs

	Dependent variable: Venture capital ratio					
Model	5	6	7	8	9	10
	PT	HT	PT	HT	HT	HT
Potential entrepreneurs	-0.0213 ***	-0.0137	0.0174 ***	0.0108	-0.0190	-0.0195
	(0.0000)	*(0.3100)*	*(0.0008)*	*(0.7320)*	*(0.1230)*	*(0.1460)*
Insolvencies[1])	-0.0087	-0.0070	-0.0541 *	-0.0909 **	-0.0043	-0.0050
	(0.5650)	*(0.8100)*	*(0.0656)*	*(0.0385)*	*(0.8750)*	*(0.9020)*
Cost of start-up[1])	0.2050	0.0440	-	-	0.0127	0.0159
	(0.1120)	*(0.9530)*	-	-	*(0.8940)*	*(0.8690)*
Tax subsidies	-0.0016 *	0.0008	0.0015	0.0022	0.0001	-0.0003
	(0.0662)	*(0.8370)*	*(0.3910)*	*(0.7390)*	*(0.9850)*	*(0.9590)*
Direct R&D subsidies	0.0001 ***	0.0001	-0.0002 **	-0.0001	0.0001	0.0001
	(0.0023)	*(0.6100)*	*(0.0348)*	*(0.6910)*	*(0.7300)*	*(0.5730)*
Business Confidence[1])	-0.3900	-0.6280	-0.7180	-0.7410	-0.5070	-0.4510
	(0.3110)	*(0.1740)*	*(0.5470)*	*(0.5220)*	*(0.3460)*	*(0.3370)*
Wages	-0.0037 ***	-0.0016	-0.0040 ***	0.0002	-0.0027	-0.0030
	(0.0000)	*(0.6130)*	*(0.0000)*	*(0.9700)*	*(0.4130)*	*(0.3270)*
Time to start business[1])	-0.0741	-0.0704	-	-	0.0000	0.0000
	(0.1270)	*(0.3470)*	-	-	*(0.3460)*	*(0.5180)*
Entrepreneurship promotion[1])	0.0095 *	0.0060	-0.0024	-0.0299	0.0085	0.0072
	(0.0991)	*(0.9540)*	*(0.9320)*	*(0.6390)*	*(0.9690)*	*(0.9670)*
Interaction with tax subs.	0.0006	0.0101	0.0040	0.0047	0.0068	0.0057
	(0.8710)	*(0.5640)*	*(0.4880)*	*(0.8740)*	*(0.7570)*	*(0.8320)*
Interaction with R&D subs.[1])	-1.7400 *	0.4430	-3.1800 **	-3.0800	-1.2500	-0.9890
	(0.0938)	*(0.9380)*	*(0.0363)*	*(0.5120)*	*(0.8360)*	*(0.8610)*
Interaction with promotion[1])	0.0257	0.0126	0.0197	-0.0947	0.0188	0.0141
	(0.2550)	*(0.9780)*	*(0.8650)*	*(0.8200)*	*(0.9830)*	*(0.9930)*
Financial Market Structure	0.0060 ***	0.0021	0.0051 **	0.0040	0.0081	0.0089 *
	(0.0000)	*(0.6620)*	*(0.0139)*	*(0.4350)*	*(0.2080)*	*(0.0654)*
Corporate Tax Rate	0.0006 ***	0.0003	0.0002	-0.0005	0.0006	0.0006
	(0.0000)	*(0.8170)*	*(0.4390)*	*(0.7510)*	*(0.5410)*	*(0.3470)*
Eta	1.0000 ***	-	1.0000 ***	-	-	-
	(0.0000)	-	*(0.0000)*	-	-	-
Constant	-0.0063 *	0.0037	-0.0073	0.0115	-0.0016	-0.0034
	(0.0973)	*(0.7820)*	*(0.5510)*	*(0.6670)*	*(0.9070)*	*(0.8100)*
Observations	75	75	168	168	75	75
R-squared	0.92	-	0.47	-	- -	-
Number of countries	-	19	-	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Potential Entrepreneurs in Tables 3 and 4 are tertiary graduates in basic sciences. Barro and Lee (2010) provide number for tertiary students in arts, business administration, and sciences. The period covered by Barro and Lee is longer and allows higher degrees of freedom. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A4: Venture capital finance and financial market structure - Regression results with logit transformed venture capital ratio

	Dependent variable: Venture capital ratio								
Model	1		2		3		4		
	PT		HT		PT		HT		
Potential entrepreneurs	-578.0000	***	-508.0000	***	-385.9000	***	-343.5000	*	
	(0.0000)		*(0.0000)*		*(0.0000)*		*(0.0558)*		
Insolvencies	0.0018		0.0018		0.0007		0.0003		
	(0.1560)		*(0.4410)*		*(0.5170)*		*(0.8380)*		
Cost of start-up	-0.0049		-0.0181		-		-		
	(0.7100)		*(0.7410)*		-		-		
Tax subsidies	-0.0010		-0.1200		1.5420	***	1.5470	*	
	(0.9980)		*(0.9120)*		*(0.0015)*		*(0.0563)*		
Direct R&D subsidies	-0.0338	*	-0.0272		-0.0281		-0.0324		
	(0.0786)		*(0.3830)*		*(0.1160)*		*(0.4230)*		
Business Confidence	-0.0244		-0.0413		0.0273		0.0186		
	(0.3070)		*(0.2060)*		*(0.3300)*		*(0.6190)*		
Wages	-3.4740	***	-2.6400		-1.5380	***	-1.6090		
	(0.0000)		*(0.1380)*		*(0.0000)*		*(0.1060)*		
Time to start business	-0.0110	***	-0.0105	**	-		-		
	(0.0000)		*(0.0195)*		-		-		
Entrepreneurship promotion[1])	2.3300	***	2.8400		-5.3100	***	-4.6600		
	(0.0000)		*(0.5880)*		*(0.0000)*		*(0.3090)*		
Financial Market Structure	2.9240	***	4.4310	**	2.028***		4.3890	**	
	(0.0000)		*(0.0301)*		*(0.0000)*		*(0.0179)*		
Corporate Tax Rate	0.5710	***	0.5180		-0.0018		0.1370		
	(0.0000)		*(0.2780)*		*(0.9760)*		*(0.7490)*		
Eta	1.0000	***	-		1.0000	***	-		
	(0.0000)		-		*(0.0000)*		-		
Constant	-16.6600	***	-11.9000		-13.6000	***	-13.6400	**	
	(0.0000)		*(0.2220)*		*(0.0000)*		*(0.0249)*		
Observations	72		72		127		127		
R-squared	0.94		-		0.76		-		
Number of countries	-		19		-		19		

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. The logit transformation expands the domain of the dependent variable from [0, 1] to [-∞, +∞] which corresponds to the domain of the normal distribution. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A5: Venture capital finance and financial market structure - Regression results with policy interactions and logit transformed venture capital ratio

	Dependent variable: Venture capital ratio											
Model	5		6		7		8		9		10	
	PT		HT		PT		HT		HT		HT	
Potential entrepreneurs	-579.1000	***	-456.9000	***	-397.8000	***	-322.0000	*	-503.2000	***	-512.2000	***
	(0.0000)		*(0.0002)*		*(0.0000)*		*(0.0880)*		*(0.0001)*		*(0.0005)*	
Insolvencies	0.0018		0.0015		0.0010		0.0000		0.0020		0.0019	
	(0.1510)		*(0.4640)*		*(0.3930)*		*(0.9900)*		*(0.3760)*		*(0.3600)*	
Cost of start-up	-0.0108		-0.0416		-		-		-0.0276		-0.0251	
	(0.3210)		*(0.5760)*		-		-		*(0.7250)*		*(0.6860)*	
Tax subsidies	1.5170	***	2.129		4.3740	***	3.9520	*	2.0330		1.927	
	(0.0058)		*(0.4490)*		*(0.0000)*		*(0.0599)*		*(0.4910)*		*(0.4970)*	
Direct R&D subsidies	-0.0166		-0.0091		-0.0704	***	-0.0374		-0.0240		-0.0184	
	(0.3360)		*(0.8990)*		*(0.0000)*		*(0.6260)*		*(0.7590)*		*(0.8290)*	
Business Confidence	-0.0246		-0.0563	**	0.0324		0.0159		-0.0434		-0.0403	
	(0.3130)		*(0.0239)*		*(0.2350)*		*(0.6500)*		*(0.1130)*		*(0.2380)*	
Wages	-3.4710	***	-1.871		-1.8430	***	-1.0720		-2.646		-2.743	
	(0.0000)		*(0.1660)*		*(0.0000)*		*(0.2340)*		*(0.1130)*		*(0.1030)*	
Time to start business	-0.0116	***	-0.0100		-		-		-0.0114	**	-0.0114	**
	(0.0000)		*(0.3150)*		-		-		*(0.0293)*		*(0.0412)*	
Entrepreneurship promotion	0.0001		0.0004		0.0015	**	0.0004		0.0002		0.0001	
	(0.8710)		*(0.9240)*		*(0.0125)*		*(0.8460)*		*(0.9130)*		*(0.9400)*	
Interaction with tax subs.	5.9900	**	9.825		13.6800	***	13.54		8.689		8.266	
	(0.0247)		*(0.5910)*		*(0.0000)*		*(0.1570)*		*(0.6330)*		*(0.5460)*	
Interaction with R&D subs.	0.1430	**	0.1030		-0.0607		-0.0326		0.0908		0.1060	
	(0.0113)		*(0.5860)*		*(0.2250)*		*(0.8930)*		*(0.7590)*		*(0.7670)*	
Interaction with promotion	-0.0007		0.0005		0.0086	***	0.0039		-0.0004		-0.0006	
	(0.7020)		*(0.9900)*		*(0.0006)*		*(0.6610)*		*(0.9650)*		*(0.9620)*	
Financial Market Structure	1.4320	***	0.5810		1.9110	***	1.315		3.136		3.284	
	(0.0004)		*(0.7970)*		*(0.0000)*		*(0.3860)*		*(0.3260)*		*(0.2470)*	
Corporate Tax Rate	0.5630	***	0.2640		0.0044		-0.0613		0.4690		0.4940	
	(0.0000)		*(0.5930)*		*(0.9510)*		*(0.9060)*		*(0.3030)*		*(0.4410)*	
Eta	1.0000	***	-		1.000*	***	-		-		-	
	(0.0000)		-		*(0.0000)*		-		-		-	
Constant	-16.8100	***	-7.0130		-15.3000	***	-10.9400	*	-11.69		-12.45	
	(0.0000)		*(0.3350)*		*(0.0000)*		*(0.0731)*		*(0.1670)*		*(0.1820)*	
Observations	72		72		127		127		72		72	
R-squared	0.94		-		0.77		-		-		-	
Number of countries	-		19		-		19		19		19	

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. The logit transformation expands the domain of the depended variable from [0, 1] to [-∞, +∞] which corresponds to the domain of the normal distribution. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included.

Table A6: Venture capital finance and financial market structure - Regression results with time variable financial structure index

	Dependent variable: Venture capital ratio									
Model	1		2		3		4		5	
	FE		RE		FE		RE		BE	
Potential entrepreneurs	-0.4520	**	-0.1900		-0.8120	**	-0.3960		-	
	(0.0275)		*(0.2310)*		*(0.0352)*		*(0.1100)*		-	
Insolvencies[1])	-0.0079		-0.0253		0.0737		-0.0401		-	
	(0.8230)		*(0.4550)*		*(0.4200)*		*(0.5420)*		-	
Cost of start-up[1])	-0.0999		-0.5330		-		-		-	
	(0.8400)		*(0.1940)*		-		-		-	
Tax subsidies	-0.0009		-0.0011		0.0027		0.0031		-	
	(0.4220)		*(0.3350)*		*(0.4230)*		*(0.2460)*		-	
Direct R&D subsidies[1])	0.1810		0.4940		-0.9320		-0.9250		-	
	(0.8210)		*(0.4630)*		*(0.6400)*		*(0.4700)*		-	
Business Confidence[1])	-0.4010		-1.3100	***	0.9360		-0.0292		-	
	(0.4140)		*(0.0091)*		*(0.4540)*		*(0.9800)*		-	
Wages	-0.0046	*	-0.0003		-0.0005		0.0000		-	
	(0.0944)		*(0.7550)*		*(0.9300)*		*(0.9760)*		-	
Time to start business[1])	-0.0768		-0.0547		-		-		-	
	(0.2610)		*(0.4320)*		-		-		-	
Entrepreneurship promotion[1])	0.0028		-0.0001		-0.0163		-0.0108		-	
	(0.6290)		*(0.9820)*		*(0.1180)*		*(0.2010)*		-	
Financial Market Structure[1])	-3.4800		2.7300		45.2000	***	37.8000	***	19.0000	*
	(0.5910)		*(0.6300)*		*(0.0000)*		*(0.0000)*		*(0.0501)*	
Corporate Tax Rate	-		-0.0001		-		-0.0003		-	
	-		*(0.8840)*		-		*(0.6160)*		-	
Constant	-0.0096		0.0152	**	-0.0062		0.0053		0.0018	***
	(0.4270)		*(0.0181)*		*(0.8030)*		*(0.6980)*		*(0.0000)*	
Observations	72		72		122		122		258	
R-squared	0.33		-		0.28		-		0.21	
Number of countries	19		19		19		19		19	

Notes: Sample includes 19 industrialized countries. FE represents the fixed effects estimator and RE the random effects estimator. HT stands for Hausman and Taylor estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Estimation chosen according to Hausman-tests. The financial market structure index is available for every year. Due to the small degree of variation over time, tables 3 and 4 use time averages for each country. In this table we allow for time variation. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A7: Venture capital finance and financial market structure - Regression results with policy interaction variables and time variable financial structure index

	Dependent variable: Venture capital ratio			
Model	5	6	7	8
	FE	RE	FE	RE
Potential entrepreneurs	-0.4570 **	-0.0820	-0.7900 **	-0.3550
	(0.0325)	*(0.4480)*	*(0.0431)*	*(0.1630)*
Insolvencies[1])	-0.0045	-0.1010 ***	0.0698	-0.0128
	(0.9140)	*(0.0031)*	*(0.4460)*	*(0.8490)*
Cost of start-up[1])	-0.1250	-1.2900 ***	-	-
	(0.8150)	*(0.0001)*	-	-
Tax subsidies	0.0000	0.0012	0.0156 *	0.0092 **
	(0.9980)	*(0.4550)*	*(0.0674)*	*(0.0247)*
Direct R&D subsidies[1])	0.4110	0.5840	-1.6600	-0.3260
	(0.7140)	*(0.2580)*	*(0.4770)*	*(0.8130)*
Business Confidence[1])	-0.3680	-2.6200 ***	0.9400	-0.1030
	(0.4760)	*(0.0002)*	*(0.4540)*	*(0.9280)*
Wages	-0.0048	0.0000	-0.0020	-0.0008
	(0.1070)	*(0.9890)*	*(0.7230)*	*(0.6330)*
Time to start business[1])	-0.0972	-0.0569	-	-
	(0.3010)	*(0.4820)*	-	-
Entrepreneurship promotion[1])	-0.0049	-0.0150	-0.0075	-0.0668
	(0.8480)	*(0.3460)*	*(0.9040)*	*(0.1190)*
Interaction with tax subs.	0.0037	0.0122 *	0.0601 *	0.0388**
	(0.8270)	*(0.0833)*	*(0.0946)*	*(0.0419)*
Interaction with R&D subs.[1])	1.3100	-1.8100	-1.2100	-3.5500
	(0.7300)	*(0.1170)*	*(0.7850)*	*(0.0971)*
Interaction with promotion[1])	-0.0330	-0.0408	0.0336	-0.2300
	(0.7610)	*(0.5230)*	*(0.8970)*	*(0.1890)*
Financial Market Structure	-0.0004	0.0010	0.0043 ***	0.0042 ****
	0.5730	*0.1790*	*0.0001*	*0.0000*
Corporate Tax Rate[1])	-	-4.7300 **	-	-3.2700
	-	*(0.0176)*	-	*(0.5890)*
Constant	-0.0109	0.0314 ***	-0.0127	0.0025
	(0.4010)	*(0.0000)*	*(0.6210)*	*(0.8570)*
Observations	72	122	74	158
R-squared	0.32	-	0.34	-
Number of countries	19	19	19	19

Notes: Sample includes 19 industrialized countries. FE represents the fixed effects estimator and RE the random effects estimator. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Estimation chosen according to Hausman-tests. The financial market structure index is available for every year. Due to the small degree of variation over time, tables 3 and 4 use time averages for each country. In this table we allow for time variation. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A8: Venture capital finance and financial market structure - Regression results excluding Canada

	Dependent variable: Venture capital ratio							
Model	1		2		3		4	
	PT		HT		PT		HT	
Potential entrepreneurs	-0.3500	***	-0.3340	**	-0.5190	***	-0.6060	*
	(0.0000)		*(0.0432)*		*(0.0002)*		*(0.0761)*	
Insolvencies[1])	-0.0044		0.0007		0.0074		-0.0008	
	(0.8260)		*(0.9860)*		*(0.8080)*		*(0.9880)*	
Cost of start-up[1])	0.0087		-0.0302		-		-	
	(0.9570)		*(0.9670)*		-		-	
Tax subsidies	-0.0009	*	-0.0010		0.0039	***	0.0032	
	(0.0746)		*(0.4500)*		*(0.0100)*		*(0.1650)*	
Direct R&D subsidies[1])	0.1420		0.2090		-1.8700	***	-1.3300	
	(0.5840)		*(0.8450)*		*(0.0003)*		*(0.3090)*	
Business Confidence[1])	-0.6460	**	-0.7380		0.9010		0.9160	
	(0.0141)		*(0.2440)*		*(0.3260)*		*(0.1100)*	
Wages	-0.0053	***	-0.0031		-0.0087	***	-0.0044	
	(0.0000)		*(0.2930)*		*(0.0000)*		*(0.2100)*	
Time to start business[1])	-0.0791	***	-0.0773		-		-	
	(0.0005)		*(0.3140)*		-		-	
Entrepreneurship promotion[1])	0.0029	***	0.0034		-0.0106	**	-0.0097	
	(0.0069)		*(0.8010)*		*(0.0313)*		*(0.5350)*	
Financial Market Structure	0.0038	***	0.0052	**	0.0067	***	0.0111	***
	(0.0000)		*(0.0234)*		*(0.0000)*		*(0.0011)*	
Corporate Tax Rate	0.0009	***	0.0006		0.0011	***	0.0007	
	(0.0000)		*(0.4810)*		*(0.0000)*		*(0.7060)*	
Eta	1.0000	***	-		1.0000	***	-	
	(0.0000)		-		*(0.0000)*		-	
Constant	-0.0133	***	-0.0032		-0.0400	***	-0.0230	
	(0.0008)		*(0.8280)*		*(0.0005)*		*(0.1780)*	
Observations	69		69		122		122	
R-squared	0.92		-		0.50		-	
Number of countries	-		18		-		18	

Notes: Sample includes 18 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. As Figure 2 indicates Canada as a potential outlier, the models in this table repeat Table 3 but eliminate all observations from Canada. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A9: Venture capital finance and financial market structure - Regression results with policy interaction terms excluding Canada

	Dependent variable: Venture capital ratio											
Model	5		6		7		8		9		10	
	PT		HT		PT		HT		HT		HT	
Potential entrepreneurs	-0.3540	***	-0.3120	*	-0.4930	***	-0.5680	***	-0.3390	**	-0.3400	**
	(0.0000)		*(0.0899)*		*(0.0022)*		*(0.0036)*		*(0.0296)*		*(0.0450)*	
Insolvencies[1])	0.0039		0.0047		0.0125		-0.0069		0.0088		0.0087	
	(0.8350)		*(0.9300)*		*(0.6320)*		*(0.8570)*		*(0.7970)*		*(0.7180)*	
Cost of start-up[1])	-0.0307		-0.1300		-		-		-0.0689		-0.0688	
	(0.8650)		*(0.9350)*		-		-		*(0.9330)*		*(0.9260)*	
Tax subsidies	0.0001		0.0000		0.0142	***	0.0108		0.0000		0.0000	
	(0.8570)		*(0.9990)*		*(0.0000)*		*(0.0990)*		*(0.9950)*		*(0.9960)*	
Direct R&D subsidies[1])	0.2670		0.5130		-2.6900	**	-1.3400		0.2470		0.2450	
	(0.2220)		*(0.7290)*		*(0.0112)*		*(0.4090)*		*(0.8730)*		*(0.7960)*	
Business Confidence[1])	-0.6310	**	-0.8020		1.0200		0.9090		-0.7270		-0.7240	
	(0.0383)		*(0.1970)*		*(0.2040)*		*(0.2570)*		*(0.2550)*		*(0.1530)*	
Wages	-0.0057	***	-0.0024		-0.0115	***	-0.0041		-0.0034		-0.0035	
	(0.0000)		*(0.2420)*		*(0.0000)*		*(0.2710)*		*(0.1630)*		*(0.2080)*	
Time to start business[1])	-0.1100	***	-0.0948		-		-		-0.1050		-0.1050	
	(0.0000)		*(0.2540)*		-		-		*(0.3420)*		*(0.2170)*	
Entrepreneurship promotion[1])	-0.0084	*	-0.0063		0.0155		-0.0112		-0.0067		-0.0067	
	(0.0588)		*(0.9220)*		*(0.5320)*		*(0.8330)*		*(0.9400)*		*(0.8910)*	
Interaction with tax subs.	0.0042		0.0048		0.0529	***	0.0429		0.0043		0.0043	
	(0.3100)		*(0.8170)*		*(0.0000)*		*(0.1420)*		*(0.8300)*		*(0.8480)*	
Interaction with R&D subs.[1])	0.5890		0.9310		-5.9100	**	-4.2500		0.1600		0.1670	
	(0.5680)		*(0.8800)*		*(0.0286)*		*(0.5200)*		*(0.9740)*		*(0.9530)*	
Interaction with promotion[1])	-0.0490	**	-0.0391		0.0993		-0.0048		-0.0434		-0.0434	
	(0.0119)		*(0.9250)*		*(0.3600)*		*(0.9850)*		*(0.9400)*		*(0.8930)*	
Financial Market Structure	0.0033	***	0.0015		0.0096	***	0.0068	*	0.0051		0.0051	
	(0.0005)		*(0.6370)*		*(0.0003)*		*(0.0705)*		*(0.2400)*		*(0.2300)*	
Corporate Tax Rate	0.0010	***	0.0005		0.0013	***	0.0004		0.0007		0.0007	
	(0.0000)		*(0.6450)*		*(0.0002)*		*(0.7590)*		*(0.4750)*		*(0.4440)*	
Eta	1.0000	***	-		1.0000	***	-		-		-	
	(0.0000)		-		*(0.0000)*		-		-		-	
Constant	-0.0155	***	0.0004		-0.0528	***	-0.0212		-0.0048		-0.0049	
	(0.0003)		*(0.9630)*		*(0.0001)*		*(0.2580)*		*(0.7280)*		*(0.7140)*	
Observations	69		69		122		122		69		69	
R-squared	0.92		-		0.53		-		-		-	
Number of countries	-		18		-		18		18		18	

Notes: Sample includes 18 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. As Figure 2 indicates Canada as a potential outlier, the models in this table repeat Table 3 but eliminate all observations from Canada. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A10: Venture capital finance and financial market structure - Regression results excluding Canada and the USA

	Dependent variable: Venture capital ratio							
Model	1		2		3		4	
	PT		HT		PT		HT	
Potential entrepreneurs	-0.3680	***	-0.3470	**	-0.5000	***	-0.5490	**
	(0.0000)		*(0.0365)*		*(0.0000)*		*(0.0133)*	
Insolvencies[1])	-0.0039		-0.0019		-0.0211		-0.0374	
	(0.7910)		*(0.9500)*		*(0.5040)*		*(0.2180)*	
Cost of start-up[1])	-0.0172		-0.0729		-		-	
	(0.8850)		*(0.9150)*		-		-	
Tax subsidies	-0.0008		-0.0010		0.0031	***	0.0027	
	(0.1280)		*(0.3530)*		*(0.0072)*		*(0.3700)*	
Direct R&D subsidies[1])	0.0715		0.2540		-0.8930		-0.2910	
	(0.7740)		*(0.7930)*		*(0.1340)*		*(0.7490)*	
Business Confidence[1])	-0.6800	*	-0.7940		1.2800		1.2900	
	(0.0754)		*(0.1870)*		*(0.1050)*		*(0.0535)*	
Wages	-0.0051	***	-0.0026		-0.0053	***	-0.0026	
	(0.0000)		*(0.3280)*		*(0.0000)*		*(0.4400)*	
Time to start business[1])	-0.0809	**	-0.0759		-		-	
	(0.0158)		*(0.2650)*		-		-	
Entrepreneurship promotion[1])	0.0031	***	0.0032		-0.0117	***	-0.0106	**
	(0.0068)		*(0.7280)*		*(0.0082)*		*(0.0195)*	
Financial Market Structure	0.0039	***	0.0058	**	0.0042	***	0.0163	***
	(0.0000)		*(0.0477)*		*(0.0000)*		*(0.0057)*	
Corporate Tax Rate[1])	8.9000	***	4.8200		4.9300	***	0.8010	
	(0.0000)		*(0.3510)*		*(0.0051)*		*(0.9390)*	
Eta	1.0000	***	-		1.0000	***	-	
	(0.0000)		-		*(0.0000)*		-	
Constant	-0.0121	**	-0.0001		-0.0297	***	-0.0178	
	(0.0120)		*(0.9940)*		*(0.0013)*		*(0.2740)*	
Observations	64		64		113		113	
R-squared	0.90		-		0.55		-	
Number of countries	-		17		-		17	

Notes: Sample includes 17 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. As Figure 2 indicates Canada and the USA as potential outliers the models in this table repeat Table 4 and eliminate all observations from Canada and the USA. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A11: Venture capital finance and financial market structure - Regression results with policy interaction terms excluding Canada and USA

	Dependent variable: Venture capital ratio					
Model	5	6	7	8	9	10
	PT	HT	PT	HT	HT	HT
Potential entrepreneurs	-0.3660 ***	-0.3230 **	-0.5630 ***	-0.5700 **	-0.3500	-0.3530 **
	(0.0000)	*(0.0418)*	*(0.0000)*	*(0.0381)*	*(0.1030)*	*(0.0346)*
Insolvencies[1])	0.0062	0.0048	-0.0209	-0.0315	0.0064	0.0073
	(0.6400)	*(0.9180)*	*(0.4160)*	*(0.3920)*	*(0.8890)*	*(0.8460)*
Cost of start-up[1])	-0.0738	-0.1590	-	-	-0.1190	-0.1290
	(0.5870)	*(0.8350)*	-	-	*(0.9000)*	*(0.8590)*
Tax subsidies	-0.0002	0.0001	0.0131 ***	0.0110 *	-0.0002	0.0000
	(0.7920)	*(0.9900)*	*(0.0000)*	*(0.0812)*	*(0.9680)*	*(0.9950)*
Direct R&D subsidies[1])	-0.3180	0.2200	-4.3300 ***	-2.6200	-0.0060	-0.1150
	(0.5120)	*(0.9240)*	*(0.0002)*	*(0.2220)*	*(0.9980)*	*(0.9710)*
Business Confidence[1])	-0.7080 *	-0.8600	1.1300	1.1400	-0.8050	-0.8180
	(0.0577)	*(0.2260)*	*(0.1880)*	*(0.1280)*	*(0.2880)*	*(0.1800)*
Wages	-0.0056 ***	-0.0024	-0.0085 ***	-0.0037	-0.0030	-0.0030
	(0.0000)	*(0.3400)*	*(0.0000)*	*(0.4030)*	*(0.3420)*	*(0.2510)*
Time to start business[1])	-0.1050 ***	-0.0954	-	-	-0.0985	-0.1000
	(0.0012)	*(0.3660)*	-	-	*(0.2370)*	*(0.4580)*
Entrepreneurship promotion[1])	-0.0030	-0.0045	0.0480 *	0.0195	-0.0032	-0.0029
	(0.6560)	*(0.9490)*	*(0.0900)*	*(0.8070)*	*(0.9600)*	*(0.9490)*
Interaction with tax subs.	0.0027	0.0051	0.0494 ***	0.0431	0.0036	0.0040
	(0.5580)	*(0.8600)*	*(0.0000)*	*(0.2060)*	*(0.8500)*	*(0.8380)*
Interaction with R&D subs.	-0.0002	0.0000	-0.0015 ***	-0.0010	-0.0001	-0.0002
	(0.4340)	*(0.9680)*	*(0.0012)*	*(0.2310)*	*(0.8860)*	*(0.9100)*
Interaction with promotion[1])	-0.0272	-0.0326	0.2320 **	0.1220	-0.0286	-0.0278
	(0.2920)	*(0.9250)*	*(0.0450)*	*(0.7850)*	*(0.9490)*	*(0.8880)*
Financial Market Structure	0.0050 ***	0.0029	0.0099 ***	0.0080	0.0068	0.0070
	(0.0007)	*(0.5090)*	*(0.0000)*	*(0.1860)*	*(0.1570)*	*(0.2000)*
Corporate Tax Rate	0.0010 ***	0.0005	0.0009 ***	0.0003	0.0005	0.0005
	(0.0000)	*(0.4190)*	*(0.0000)*	*(0.7790)*	*(0.4870)*	*(0.5510)*
Eta	1.0000 ***	-	1.0000 ***	-	-	-
	(0.0000)	-	*(0.0000)*	-	-	-
Constant	-0.0135 ***	0.0012	-0.0406 ***	-0.0211	-0.0015	-0.0014
	(0.0036)	*(0.9290)*	*(0.0004)*	*(0.3090)*	*(0.9280)*	*(0.9030)*
Observations	64	64	113	113	64	64
R-squared	0.91	-	0.60	-	-	-
Number of countries	-	17	-	17	17	17

Notes: Sample includes 17 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. As Figure 2 indicates Canada and the USA as potential outliers the models in this table repeat Table 4 and eliminate all observations from Canada and USA. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A12: Venture capital finance and financial market structure - Regression results including gross domestic product

	Dependent variable: Venture capital ratio							
Model	1		2		3		4	
	PT		HT		PT		HT	
Potential entrepreneurs	-0.4820	***	-0.4470	**	-0.4250	***	-0.5210	
	(0.0000)		*(0.0295)*		*(0.0087)*		*(0.1610)*	
Insolvencies[1])	0.0010		0.0036		0.0425		0.0090	
	(0.9530)		*(0.9050)*		*(0.3200)*		*(0.9090)*	
Cost of start-up[1])	-0.0206		-0.0838		-		-	
	(0.8990)		*(0.8960)*		-		-	
Tax subsidies	-0.0009	**	-0.0009		0.0048	**	0.0047	
	(0.0364)		*(0.5790)*		*(0.0238)*		*(0.2460)*	
Direct R&D subsidies[1])	0.0766		0.0284		-2.4700	***	-1.7200	
	(0.7050)		*(0.9670)*		*(0.0072)*		*(0.3630)*	
Business Confidence[1])	-0.0008		-0.2080		-1.9900	*	-1.5600	
	(0.9980)		*(0.7680)*		*(0.0919)*		*(0.4920)*	
Wages	-0.0048	***	-0.0030		-0.0041	***	-0.0015	
	(0.0000)		*(0.3010)*		*(0.0000)*		*(0.6270)*	
Time to start business[1])	-0.0924	***	-0.0928		-		-	
	(0.0002)		*(0.1490)*		-		-	
Entrepreneurship promotion[1])	0.0036	***	0.0038		-0.0118	**	-0.0067	
	(0.0030)		*(0.4040)*		*(0.0170)*		*(0.7860)*	
GDP	-0.0131	**	-0.0111		0.0873	***	0.0748	
	(0.0131)		*(0.5570)*		*(0.0027)*		*(0.1920)*	
Financial Market Structure	0.0038	***	0.0055	*	0.0045	***	0.0077	*
	(0.0000)		*(0.0641)*		*(0.0000)*		*(0.0581)*	
Corporate Tax Rate	0.0009	***	0.0007		0.0003		0.0002	
	(0.0000)		*(0.5160)*		*(0.2530)*		*(0.8800)*	
Eta	1.0000	***	-		1.0000	***	-	
	(0.0000)		-		*(0.0000)*		-	
Constant	-0.0167	***	-0.0073		0.0065		0.0122	
	(0.0003)		*(0.6700)*		*(0.5750)*		*(0.5440)*	
Observations	73		73		128		128	
R-squared	0.92		-		0.53		-	
Number of countries	-		19		-		19	

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. The general model for demand in Dixit and Stiglitz (1973) has a link between income and demand for the differentiated product. A generalized version of equation (20) therefore may include income. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A13: Venture capital finance and financial market structure - Regression results with policy interactions terms including Gross Domestic Product

	Dependent variable: Venture capital ratio					
Models	5	6	7	8	9	10
	PT	HT	PT	HT	HT	HT
Potential entrepreneurs	-0.4950 ***	-0.418* *	-0.3120 **	-0.3810	-0.4560 **	-0.4630 **
	(0.0000)	*(0.0564)*	*(0.0237)*	*(0.2720)*	*(0.0464)*	*(0.0127)*
Insolvencies[1])	0.0085	0.0044	0.0553 *	0.0274	0.0122	0.0117
	(0.5030)	*(0.8970)*	*(0.0781)*	*(0.7150)*	*(0.6860)*	*(0.7550)*
Cost of start-up[1])	-0.0362	-0.2500	-	-	-0.1400	-0.1150
	(0.8220)	*(0.8100)*	-	-	*(0.8670)*	*(0.8910)*
Tax subsidies	0.0002	0.0012	0.0156 ***	0.0125 **	0.0013	0.0010
	(0.8260)	*(0.8270)*	*(0.0000)*	*(0.0221)*	*(0.8060)*	*(0.8370)*
Direct R&D subsidies[1])	0.4070 *	0.3350	-3.4000 ***	-1.5200	0.1350	0.2740
	(0.0757)	*(0.8670)*	*(0.0053)*	*(0.5740)*	*(0.9250)*	*(0.8550)*
Business Confidence[1])	0.1140	-0.3790	-2.5900 **	-2.5500	-0.1270	-0.0721
	(0.8100)	*(0.5240)*	*(0.0348)*	*(0.3750)*	*(0.8270)*	*(0.9130)*
Wages	-0.0051 ***	-0.0021	-0.0073 ***	-0.0019	-0.0033	-0.0035
	(0.0000)	*(0.4770)*	*(0.0000)*	*(0.6780)*	*(0.3680)*	*(0.2040)*
Time to start business[1])	-0.1270 ***	-0.1010	-	-	-0.1250	-0.1250
	(0.0000)	*(0.2960)*	-	-	*(0.2050)*	*(0.1970)*
Entrepreneurship promotion[1])	-0.0087	-0.0026	0.0066	-0.0402	-0.0055	-0.0066
	(0.1570)	*(0.9690)*	*(0.8280)*	*(0.7810)*	*(0.9780)*	*(0.8660)*
Interaction with tax subs.	0.0043	0.0089	0.0560 ***	0.0473	0.0089	0.0079
	(0.2750)	*(0.6480)*	*(0.0000)*	*(0.1490)*	*(0.6920)*	*(0.7510)*
Interaction with R&D subs.[1])	1.8000 *	1.4200	-8.8000 **	-6.9900	1.1300	1.4000
	(0.0503)	*(0.8560)*	*(0.0083)*	*(0.4810)*	*(0.8630)*	*(0.7670)*
Interaction with promotion[1])	-0.0532 *	-0.0237	0.0628	-0.1340	-0.0401	-0.0445
	(0.0531)	*(0.9760)*	*(0.6250)*	*(0.8520)*	*(0.9670)*	*(0.7910)*
GDP	-0.0153 **	-0.0087	0.1060 ***	0.1020	-0.0128	-0.0133
	(0.0369)	*(0.6000)*	*(0.0004)*	*(0.1100)*	*(0.4500)*	*(0.5020)*
Financial Market Structure	0.0024 ***	0.0009	0.0096 ***	0.0073	0.0044	0.0046
	(0.0029)	*(0.8300)*	*(0.0001)*	*(0.2770)*	*(0.3560)*	*(0.3160)*
Corporate Tax Rate	0.0010 ***	0.0004	0.0005 **	-0.0001	0.0007	0.0007
	(0.0000)	*(0.6030)*	*(0.0366)*	*(0.9650)*	*(0.5730)*	*(0.5130)*
Eta	1.0000 ***	-	1.0000 ***	-	-	-
	(0.0000)	-	*(0.0000)*	-	-	-
Constant	-0.0197 ***	-0.0018	-0.0018	0.0198	-0.0095	-0.0107
	(0.0009)	*(0.9080)*	*(0.8660)*	*(0.5570)*	*(0.6100)*	*(0.4890)*
Observations	73	73	128	128	73	73
R-squared	0.92	-	0.56	-	-	-
Number of countries	-	19	-	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. The general model for demand in Dixit and Stiglitz (1973) allows for a link between income and demand for the differentiated product. A generalized version of equation (20) therefore may include income. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A14: Venture capital finance and financial market structure - Regression results with asymptotic standard errors

	Dependent variable: Venture capital ratio			
Model	1	2	3	4
	PT	HT	PT	HT
Potential entrepreneurs	-0.4690 ***	-0.4380 ***	-0.8020 ***	-0.8040 ***
	(0.0000)	*(0.0090)*	*(0.0000)*	*(0.0098)*
Insolvencies[1])	-0.0021	0.0014	0.0145	-0.0084
	(0.8970)	*(0.9640)*	*(0.7460)*	*(0.9200)*
Cost of start-up[1])	-0.1060	-0.1650	-	-
	(0.5070)	*(0.7000)*	-	-
Tax subsidies	-0.0009	-0.0008	0.0039 **	0.0038
	(0.1050)	*(0.4180)*	*(0.0391)*	*(0.2210)*
Direct R&D subsidies[1])	0.1700	0.0868	-1.8800 **	-1.6800
	(0.4140)	*(0.9010)*	*(0.0121)*	*(0.3140)*
Business Confidence[1])	-0.4760	-0.6190	1.5300	1.3600
	(0.1370)	*(0.1470)*	*(0.1470)*	*(0.2680)*
Wages	-0.0046 ***	-0.0028 *	-0.0067 ***	-0.0034
	(0.0000)	*(0.0710)*	*(0.0000)*	*(0.2350)*
Time to start business[1])	-0.0746 **	-0.0785	-	-
	(0.0414)	*(0.2030)*	-	-
Entrepreneurship promotion[1])	0.0027 **	0.0033	-0.0113 **	-0.0093
	(0.0479)	*(0.5130)*	*(0.0455)*	*(0.3650)*
Financial Market Structure	0.0036 ***	0.0054 **	0.0065 ***	0.0111 **
	(0.0000)	*(0.0229)*	*(0.0000)*	*(0.0177)*
Corporate Tax Rate[1])	8.5700 ***	6.4700	8.7700 **	6.3100
	(0.0000)	*(0.3130)*	*(0.0213)*	*(0.5730)*
Eta	1.0000 ***	-	1.0000 ***	-
	(0.0000)	-	*(0.0000)*	-
Constant	-0.0115 ***	-0.0026	-0.0371 ***	-0.0221
	(0.0059)	*(0.7600)*	*(0.0030)*	*(0.2330)*
Observations	73	73	128	128
R-squared	0.92	-	0.50	-
Number of countries	-	19	-	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are asymptotic values. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A15: Venture capital finance and financial market structure - Regression results with policy interactions and asymptotic standard errors

	Dependent variable: Venture capital ratio					
Model	5	6	7	8	9	10
	PT	HT	PT	HT	HT	HT
Potential entrepreneurs	-0.4740 ***	-0.4020 **	-0.7860 ***	-0.7280 **	-0.4420 **	-0.4480 ***
	(0.0000)	*(0.0162)*	*(0.0000)*	*(0.0163)*	*(0.0101)*	*(0.0092)*
Insolvencies[1])	0.0034	0.0018	0.0203	-0.0140	0.0089	0.0081
	(0.8550)	*(0.9580)*	*(0.6610)*	*(0.8630)*	*(0.7960)*	*(0.8130)*
Cost of start-up[1])	-0.1260	-0.3230	-	-	-0.2260	-0.2070
	(0.4650)	*(0.4600)*	-	-	*(0.6160)*	*(0.6480)*
Tax subsidies	-0.0003	0.0012	0.0137 ***	0.0109 *	0.0011	0.0008
	(0.6430)	*(0.7040)*	*(0.0000)*	*(0.0531)*	*(0.7550)*	*(0.8260)*
Direct R&D subsidies[1])	0.3410	0.3450	-2.7600 ***	-1.3500	0.1120	0.2370
	(0.1330)	*(0.6880)*	*(0.0013)*	*(0.4470)*	*(0.9030)*	*(0.8040)*
Business Confidence[1])	-0.4570	-0.7180 *	1.6600	1.3100	-0.6080	-0.5760
	(0.1840)	*(0.0975)*	*(0.1210)*	*(0.2720)*	*(0.1650)*	*(0.1890)*
Wages	-0.0049 ***	-0.0019	-0.0093 ***	-0.0026	-0.0030 *	-0.0032 *
	(0.0000)	*(0.2030)*	*(0.0000)*	*(0.3550)*	*(0.0723)*	*(0.0693)*
Time to start business[1])	-0.0966 **	-0.0873	-	-	-0.1040	-0.1020
	(0.0146)	*(0.2660)*	-	-	*(0.2010)*	*(0.2060)*
Entrepreneurship promotion[1])	-0.0059	-0.0022	0.0196	-0.0194	-0.0045	-0.0052
	(0.4940)	*(0.9170)*	*(0.5550)*	*(0.7250)*	*(0.8370)*	*(0.8120)*
Interaction with tax subs.	0.0024	0.0090	0.0503 ***	0.0434 *	0.0078	0.0068
	(0.4620)	*(0.4510)*	*(0.0000)*	*(0.0891)*	*(0.5520)*	*(0.6090)*
Interaction with R&D subs.[1])	0.7920	1.1400	-5.7900 **	-4.0200	0.5280	0.7200
	(0.3710)	*(0.6770)*	*(0.0191)*	*(0.3340)*	*(0.8630)*	*(0.8160)*
Interaction with promotion[1])	-0.0373	-0.0195	0.1200	-0.0367	-0.0332	-0.0359
	(0.2800)	*(0.8240)*	*(0.3740)*	*(0.8730)*	*(0.7180)*	*(0.6970)*
Financial Market Structure	0.0029 ***	0.0009	0.0094 ***	0.0064	0.0047	0.0049
	(0.0000)	*(0.7630)*	*(0.0000)*	*(0.1930)*	*(0.2070)*	*(0.2040)*
Corporate Tax	0.0009 ***	0.0004	0.0011 ***	0.0002	0.0007	0.0007
	(0.0000)	*(0.5070)*	*(0.0067)*	*(0.8820)*	*(0.3270)*	*(0.3340)*
Eta	1.0000 ***	-	1.0000 ***	-	-	-
	(0.0000)	-	*(0.0000)*	-	-	-
Constant	-0.0130 ***	0.0023	-0.0493 ***	-0.0178	-0.0038	-0.0047
	(0.0051)	*(0.7810)*	*(0.0003)*	*(0.3160)*	*(0.6800)*	*(0.6140)*
Observations	73	73	128	128	73	73
R-squared	0.92	-	0.52	-	-	-
Number of countries	-	19	-	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are asymptotic values. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A16: Venture capital finance and financial market structure - Regression results with venture capital to GDP ratio as endogenous variable

	Dependent variable: Venture capital ratio							
Model	1		2		3		4	
	PT		HT		PT		HT	
Potential entrepreneurs	-0.0513	***	-0.0482	***	-0.1010	***	-0.0998	**
	(0.0000)		*(0.0057)*		*(0.0000)*		*(0.0244)*	
Insolvencies[1])	0.0002		0.0006		0.0031		0.0002	
	(0.9110)		*(0.8200)*		*(0.4150)*		*(0.9820)*	
Cost of start-up[1])	-0.0179		-0.0271		-		-	
	(0.2940)		*(0.7270)*		-		-	
Tax subsidies	-0.0001	**	-0.0001		0.0005	*	0.0004	
	(0.0293)		*(0.3460)*		*(0.0864)*		*(0.1140)*	
Direct R&D subsidies[1])	0.0414		0.0267		-0.1970	*	-0.1740	
	(0.1320)		*(0.7750)*		*(0.0683)*		*(0.4370)*	
Business Confidence[1])	-0.0733	**	-0.0921	*	0.2390	**	0.2160	**
	(0.0496)		*(0.0783)*		*(0.0195)*		*(0.0196)*	
Wages	-0.0006	***	-0.0004		-0.0009	***	-0.0004	
	(0.0000)		*(0.2890)*		*(0.0000)*		*(0.3990)*	
Time to start business[1])	-0.0142	***	-0.0148	*	-		-	
	(0.0000)		*(0.0978)*		-		-	
Entrepreneurship promotion[1])	0.0005	***	0.0005		-0.0014	***	-0.0012	
	(0.0004)		*(0.7540)*		*(0.0004)*		*(0.5890)*	
Financial Market Structure	0.0004	***	0.0006	**	0.0008	***	0.0013	**
	(0.0000)		*(0.0260)*		*(0.0000)*		*(0.0388)*	
Corporate Tax Rate[1])	1.0900	***	0.7950		1.1800	***	0.8250	
	(0.0000)		*(0.2900)*		*(0.0002)*		*(0.6640)*	
Eta	1.0000	***	-		1.0000	***	-	
	(0.0000)		-		*(0.0000)*		-	
Constant	-0.0014	***	-0.0002		-0.0052	***	-0.0033	
	(0.0024)		*(0.8950)*		*(0.0000)*		*(0.1180)*	
Observations	73		73		134		134	
R-squared	0.91		-		0.47		-	
Number of countries	-		19		-		19	

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are asymptotic values. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. A more common normalization of venture capital activity is the ratio of venture capital investments to GDP. In this table we use GDP instead of investments as the denominator in the venture capital ratio. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A17: Venture capital finance and financial market structure - Regression results with policy interactions and venture capital to GDP ratio as endogenous variable

	Dependent variable: Venture capital ratio					
Model	5	6	7	8	9	10
	PT	HT	PT	HT	HT	HT
Potential entrepreneurs	-0.0519 ***	-0.0437 *	-0.1020 ***	-0.0938 *	-0.0485 **	-0.0492 **
	(0.0000)	*(0.0713)*	*(0.0001)*	*(0.0669)*	*(0.0232)*	*(0.0269)*
Insolvencies[1])	0.0001	0.0000	0.0043	-0.0003	0.0009	0.0008
	(0.9590)	*(0.9970)*	*(0.2170)*	*(0.9610)*	*(0.8360)*	*(0.8380)*
Cost of start-up[1])	-0.0203	-0.0478	-	-	-0.0361	-0.0329
	(0.2990)	*(0.6890)*	-	-	*(0.6980)*	*(0.7560)*
Tax subsidies	0.0000	0.0002	0.0015 ***	0.0013 *	0.0002	0.0001
	(0.8050)	*(0.9570)*	*(0.0000)*	*(0.0656)*	*(0.7770)*	*(0.8490)*
Direct R&D subsidies[1])	0.0642 ***	0.0473	-0.3620 ***	-0.1740	0.0256	0.0457
	(0.0057)	*(0.7860)*	*(0.0073)*	*(0.4170)*	*(0.8690)*	*(0.7270)*
Business Confidence[1])	-0.0717 *	-0.1050 *	0.2570 **	0.2190 **	-0.0921	-0.0871
	(0.0916)	*(0.0676)*	*(0.0442)*	*(0.0257)*	*(0.1650)*	*(0.1260)*
Wages	-0.0006 ***	-0.0002	-0.0011 ***	-0.0003	-0.0004	-0.0004
	(0.0000)	*(0.3350)*	*(0.0000)*	*(0.5480)*	*(0.3050)*	*(0.2570)*
Financial Market Structure	0.0003 **	0.0001	0.0012 ***	0.0008	0.0004	0.0005
	(0.0149)	*(0.9150)*	*(0.0000)*	*(0.3280)*	*(0.3850)*	*(0.4320)*
Time to start business[1])	-0.0146 ***	-0.0135	-	-	-0.0157 *	-0.0155
	(0.0000)	*(0.1710)*	-	-	*(0.0937)*	*(0.1260)*
Entrepreneurship promotion[1])	0.0004	0.0009	0.0038	-0.0005	0.0005	0.0004
	(0.5930)	*(0.8870)*	*(0.2450)*	*(0.9510)*	*(0.9810)*	*(0.9100)*
Corporate Tax[1])	1.0800 ***	0.4320	1.4200 ***	0.2560	0.7360	0.7760
	(0.0000)	*(0.9100)*	*(0.0001)*	*(0.8820)*	*(0.6010)*	*(0.4230)*
Interaction with tax subs.	0.0004	0.0012	0.0054 ***	0.0051 *	0.0012	0.0010
	(0.3910)	*(0.8860)*	*(0.0000)*	*(0.0554)*	*(0.6280)*	*(0.6850)*
Interaction with R&D subs.[1])	0.1700	0.1620	-0.7640 **	-0.4910	0.1200	0.1510
	(0.2460)	*(0.8050)*	*(0.0242)*	*(0.5170)*	*(0.8360)*	*(0.7350)*
Interaction with promotion[1])	-0.0003	0.0024	0.0212	0.0037	0.0002	-0.0002
	(0.9030)	*(0.9330)*	*(0.1340)*	*(0.9400)*	*(0.9980)*	*(0.9970)*
Eta	1.0000 ***	-	1.0000 ***	-	-	-
	(0.0000)	-	*(0.0000)*	-	-	-
Constant	-0.0014 ***	0.0005	-0.0066 ***	-0.0028	-0.0002	-0.0003
	(0.0064)	*(0.6600)*	*(0.0000)*	*(0.2040)*	*(0.8890)*	*(0.8120)*
Observations	73	73	134	134	73	73
R-squared	0.91	-	0.49	-	-	-
Number of countries	-	19	-	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are not bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Interactions between Financial market structure and three policy instruments (tax subsidies, direct R&D subsidies, and entrepreneurship promotion programs) included. In this table we use GDP instead of investments as the denominator in the venture capital ratio. - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A18: Venture capital finance and financial market structure - Regression results with Mundlak pretest for exogeneity

	Dependent variable: Venture capital ratio							
Model			2'				4'	
	Mundlak		HT		Mundlak		HT	
Potential entrepreneurs	-0.3900	*	-0.4310	**	-0.9170	*	-0.8050	**
	(0.0825)		*(0.0473)*		*(0.0657)*		*(0.0365)*	
Insolvencies[1])	-0.0052		-0.0035		0.0130		-0.0082	
	(0.8740)		*(0.9180)*		*(0.8190)*		*(0.8790)*	
Cost of start-up[1])	-0.3230		-0.1620		-		-	
	(0.6380)		*(0.8270)*		-		-	
Tax subsidies	-0.0013		-0.0009		0.0034		0.0038	
	(0.4070)		*(0.6390)*		*(0.3770)*		*(0.1810)*	
Direct R&D subsidies[1])	0.0492		0.1320		-2.7600		-1.6700	
	(0.9540)		*(0.8730)*		*(0.1680)*		*(0.2200)*	
Business Confidence[1])	-0.3870		-0.5440		1.2500		1.3700	*
	(0.5020)		*(0.3640)*		*(0.1790)*		*(0.0791)*	
Wages	-0.0008		-0.0031		-0.0050		-0.0034	
	(0.8440)		*(0.2180)*		*(0.5050)*		*(0.3760)*	
Time to start business[1])	-0.1090		-0.0789		-		-	
	(0.1820)		*(0.4220)*		-		-	
Entrepreneurship promotion[1])	0.0018		0.0034		-0.0089		-0.0093	
	(0.9160)		*(0.9430)*		*(0.6230)*		*(0.7660)*	
Corporate Tax Rate[1])[2])	-3.7000	**	-0.5560		1.0300		-0.0476	
	(0.0397)		*(0.7450)*		*(0.8350)*		*(0.9920)*	
Financial Market Structure	-0.0003		0.0055	***	0.0023		0.0111	**
	(0.9950)		*(0.0091)*		*(0.8960)*		*(0.0120)*	
Avg. Potential entrepreneurs	0.3830		-		1.5010		-	
	(0.9790)		-		*(0.8710)*		-	
Avg. Insolvencies[1])	-0.2400		-		-0.1900		-	
	(0.9020)		-		*(0.9130)*		-	
Avg. Cost of start-up	-0.0002		-		-		-	
	(0.7450)		-		-		-	
Avg. Tax subsidies	-0.0002		-		-0.0055		-	
	(0.9970)		-		*(0.9430)*		-	
Avg. Direct R&D subsidies	0.0002		-		0.0004		-	
	(0.8900)		-		*(0.8130)*		-	
Avg. Business Confidence	0.0015		-		0.0022		-	
	(0.9910)		-		*(0.9580)*		-	
Avg. Wages	0.0011		-		0.0062		-	
	(0.9840)		-		*(0.8870)*		-	
Avg. Time to start business[1])	0.3170		-		-		-	
	(0.9680)		-		-		-	
Avg. Entrepr. promotion[1])	-0.0311		-		-0.0236		-	
	(0.9660)		-		*(0.9360)*		-	
Avg. Corporate Tax Rate	-0.0002		0.0008		-0.0016		0.0006	
	(0.9840)		*(0.3320)*		*(0.8790)*		*(0.6360)*	
Constant	-0.1330		-0.0045		-0.2170		-0.0222	
	(0.9920)		*(0.7300)*		*(0.9560)*		*(0.2040)*	
Observations	73		73		128		128	
Number of countries	19		19		19		19	

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and Mundlak stands for the Mundlak (1978) first stage estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. - 1) For better visibility the coefficient is multiplied by a factor 10,000. - 2) Time varying values for corporate tax rate. The time invariant averages used in Tables 3 and 4 are in the lower part of the table.

Table A19: Venture capital finance and financial market structure - Regression results with policy interactions and Mundlak pretest for exogeneity

	Dependent variable: Venture capital ratio							
Model			6'				8'	
	Mundlak		HT		Mundlak		HT	
Potential entrepreneurs	-0.4020	*	-0.4070	*	-0.9740	**	-0.7280	*
	(0.0625)		*(0.0600)*		*(0.0265)*		*(0.0542)*	
Insolvencies[1])	0.0045		-0.0026		0.0333		-0.0115	
	(0.9160)		*(0.9520)*		*(0.5780)*		*(0.8540)*	
Cost of start-up[1])	-0.2160		-0.2990		-		-	
	(0.6720)		*(0.7220)*		-		-	
Tax subsidies	0.0019		0.0007		0.0107		0.0111	**
	(0.4170)		*(0.8820)*		*(0.1590)*		*(0.0468)*	
Direct R&D subsidies[1])	-0.2210		0.3620		-4.1400	**	-1.3400	
	(0.7920)		*(0.8020)*		*(0.0175)*		*(0.4550)*	
Business Confidence[1])	-0.4560		-0.6380		0.5930		1.0900	
	(0.3800)		*(0.3810)*		*(0.3790)*		*(0.1440)*	
Wages	-0.0069	**	-0.0022		-0.0044		-0.0024	
	(0.0126)		*(0.4190)*		*(0.5220)*		*(0.6380)*	
Time to start business[1])	-0.1830	**	-0.0847		-		-	
	(0.0235)		*(0.4790)*		-		-	
Entrepreneurship promotion[1])	-0.0241		-0.0009		-0.0262		-0.0207	
	(0.2590)		*(0.9890)*		*(0.6280)*		*(0.8380)*	
Interaction with tax subs.	0.0117		0.0074		0.0492		0.0450	
	(0.2670)		*(0.7400)*		*(0.1730)*		*(0.2000)*	
Interaction with R&D subs.	0.0002		0.0001		-0.0004		-0.0004	
	(0.5980)		*(0.8460)*		*(0.5510)*		*(0.5130)*	
Interaction with promotion[1])	-0.1210		-0.0154		-0.0518		-0.0409	
	(0.1690)		*(0.9790)*		*(0.8940)*		*(0.9280)*	
Corporate Tax Rate[2])	-0.0002		0.0000		0.0005		0.0001	
	(0.2520)		*(0.8340)*		*(0.2720)*		*(0.7570)*	
Financial Market Structure	0.0039	***	0.0012		0.0033		0.0061	
	(0.0048)		*(0.7640)*		*(0.9720)*		*(0.2170)*	

Table A19 continued: Venture capital finance and financial market structure - Regression results with policy interactions and Mundlak pretest for exogeneity

	Dependent variable: Venture capital ratio			
Model	6'		8'	
	Mundlak	HT	Mundlak	HT
Avg. Potential entrepreneurs	0.3690	-	1.5780	-
	(0.2620)	-	*(0.8290)*	-
Avg. Insolvencies[1])	-0.2510 ***	-	-0.1400	-
	(0.0000)	-	*(0.9240)*	-
Avg. Cost of start-up	-0.0003 ***	-	-	-
	(0.0000)	-	-	-
Avg. Tax subsidies	-0.0048 *	-	-0.0103	-
	(0.0987)	-	*(0.9100)*	-
Avg. Direct R&D subsidies	0.0003 ***	-	0.0005	-
	(0.0005)	-	*(0.9260)*	-
Avg. Business Confidence	0.0010 *	-	0.0011	-
	(0.0849)	-	*(0.9820)*	-
Avg. Wages	0.0064 **	-	0.0045	-
	(0.0108)	-	*(0.9040)*	-
Avg. Time to start business[1])	0.4280 ***	-		-
	(0.0032)	-		-
Avg. Entrepr. promotion[1])	-0.0376 ***	-	-0.0331	-
	(0.0000)	-	*(0.9180)*	-
Avg. Int. with tax subs.	-0.0254	-	-0.0322	-
	(0.2930)	-	*(0.9560)*	-
Avg. Int. with R&D subs.	-0.0004	-	0.0002	-
	(0.1820)	-	*(0.9880)*	-
Avg. Int. with promotion[1])	0.0224	-	-0.1180	-
	(0.7660)	-	*(0.9780)*	-
Avg. Corporate Tax Rate	-0.0006	0.0005	-0.0018	0.0000
	(0.1850)	*(0.5720)*	*(0.9280)*	*(0.9760)*
Constant	-0.0916	0.0003	-0.1140	-0.0148
	(0.1230)	*(0.9810)*	*(0.9820)*	*(0.5150)*
Observations	73	73	128	128
Number of countries	19	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and Mundlak stands for the Mundlak (1978) first stage estimator. Numbers in parenthesis are p-values. Standard errors are bootstrapped. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. - 1) For better visibility the coefficient is multiplied by a factor 10,000. - 2) Time varying values for corporate tax rate. The time invariant averages used in Tables 3 and 4 are in the lower part of the table.

Table A20: Venture capital finance and financial market structure - Regression results with financial market complementarity added

	Dependent variable: Venture capital ratio			
Model	1	2	3	4
	PT	HT	PT	HT
Potential entrepreneurs	-0.4690 ***	-0.4140 *	-0.8020 ***	-0.8060 **
	(0.0000)	*(0.0493)*	*(0.0000)*	*(0.0379)*
Cost of start-up[1])	-0.0106	-0.2450	-	-
	(0.4810)	*(0.7360)*	-	-
Time to start business[1])	-0.0075 **	-0.0692	-	-
	(0.0162)	*(0.1480)*	-	-
Wages	-0.0046 ***	-0.0022	-0.0067 ***	-0.0043
	(0.0000)	*(0.2170)*	*(0.0000)*	*(0.3320)*
Entrepreneurship promotion[1])	0.0003 **	0.0027	-0.0113 ***	-0.0083
	(0.0164)	*(0.6090)*	*(0.0059)*	*(0.4390)*
Insolvencies[1])	-0.0002	-0.0030	0.0145	-0.0052
	(0.9050)	*(0.8910)*	*(0.6180)*	*(0.9050)*
Tax subsidies	-0.0009	-0.0010	0.0039 **	0.0037
	(0.1030)	*(0.3070)*	*(0.0480)*	*(0.1230)*
Direct R&D subsidies[1])	0.0170	0.2720	-1.8800 **	-1.5700
	(0.5340)	*(0.6770)*	*(0.0446)*	*(0.2630)*
Business confidence[1])	-0.0476	-0.6850	1.5300 *	1.4100 *
	(0.1430)	*(0.1370)*	*(0.0957)*	*(0.0697)*
Financial market complementarity	0.0007 ***	0.0002	0.0007 **	0.0007
	(0.0000)	*(0.8130)*	*(0.0461)*	*(0.6260)*
Financial market structure	0.0029 ***	0.0022	0.0059 ***	0.0109 **
	(0.0000)	*(0.2610)*	*(0.0000)*	*(0.0377)*
Corporate tax rate	0.0009 ***	0.0005	0.0009 ***	0.0009
	(0.0000)	*(0.4170)*	*(0.0004)*	*(0.4000)*
Eta	1.0000 ***	-	1.0000 ***	-
	(0.0000)	-	*(0.0000)*	-
Constant	-0.0116 ***	0.0007	-0.0372 ***	-0.0269
	(0.0069)	*(0.9380)*	*(0.0008)*	*(0.1530)*
Observations	73	128	73	128
Number of countries	19	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are asymptotic values. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Song and Thakor (2010) argue that market and bank based institutions are complements rather than substitutes. We therefore include the variable Financial Market Complementarity to take account of this issue (cf. Table A1 for a definition of Financial Market Complementarity). - 1) For better visibility the coefficient is multiplied by a factor 10,000.

Table A21 continued: Venture capital finance and financial market structure - Regression results with policy interactions financial market complementarity added

	Dependent variable: Venture capital ratio					
Model	1	2	3	4	5	6
	PT	HT	PT	HT	HT	HT
Potential entrepreneurs	-0.4740 ***	-0.4070	-0.7860 ***	-0.7240	-0.4520 *	-0.4520 **
	(0.0000)	*(0.1090)*	*(0.0000)*	*(0.1700)*	*(0.0739)*	*(0.0304)*
Insolvencies[1])	0.0034	0.0025	0.0203	-0.0146	0.0112	0.0112
	(0.8360)	*(0.9360)*	*(0.4580)*	*(0.7870)*	*(0.6320)*	*(0.7930)*
Cost of start-up[1])	-0.1260	-0.3320	-	-	-0.2430	-0.2300
	(0.4140)	*(0.7030)*	-	-	*(0.7990)*	*(0.7690)*
Tax subsidies	-0.0003	0.0010	0.0137 ***	0.0113*	0.0009	0.0007
	(0.7400)	*(0.8130)*	*(0.0001)*	*(0.0676)*	*(0.8790)*	*(0.8870)*
Direct R&D subsidies[1])	0.3410	0.4460	-2.7600 **	-1.4600	0.3110	0.4640
	(0.1920)	*(0.7610)*	*(0.0115)*	*(0.4850)*	*(0.8340)*	*(0.7430)*
Business confidence[1])	-0.4570	-0.6970	1.6600 **	1.2600	-0.5580	-0.5320
	(0.2280)	*(0.1330)*	*(0.0227)*	*(0.1500)*	*(0.3570)*	*(0.3990)*
Wages	-0.0049 ***	-0.0022	-0.0093 ***	-0.0020	-0.0038	-0.0039
	(0.0000)	*(0.3370)*	*(0.0000)*	*(0.6360)*	*(0.1680)*	*(0.1910)*
Financial market complementarity	0.0008 ***	0.0002	0.0003	-0.0004	0.0007	0.0008
	(0.0000)	*(0.7740)*	*(0.3990)*	*(0.8090)*	*(0.5920)*	*(0.5810)*
Financial market structure	0.0022 **	0.0005	0.0092 ***	0.0057	0.0040	0.0041
	(0.0188)	*(0.9080)*	*(0.0014)*	*(0.3070)*	*(0.4320)*	*(0.5030)*
Time to start business[1])	-0.0966 ***	-0.0914	-	-	-0.1160 *	-0.1170
	(0.0007)	*(0.1190)*	-	-	*(0.0879)*	*(0.3100)*
Entrepreneurship promotion[1])	-0.0059	-0.0044	0.0196	-0.0134	-0.0099	-0.0114
	(0.4510)	*(0.9220)*	*(0.4690)*	*(0.9350)*	*(0.6030)*	*(0.9130)*
Corporate tax rate	0.0010 ***	0.0005	0.0011 ***	0.0000	0.0009	0.0009
	(0.0000)	*(0.5130)*	*(0.0003)*	*(0.9940)*	*(0.2340)*	*(0.2950)*
Interaction with tax subs.	0.0024	0.0086	0.0503 ***	0.0451	0.0073	0.0068
	(0.6270)	*(0.6580)*	*(0.0001)*	*(0.1310)*	*(0.7790)*	*(0.7700)*
Interaction with R&D subs.[1])	0.7920	1.4500	-5.7900 *	-3.4900	1.1700	1.4600
	(0.4780)	*(0.7430)*	*(0.0598)*	*(0.6180)*	*(0.8530)*	*(0.7740)*
Interaction with promotion[1])	-0.0373	-0.0295	0.1200	-0.0085	-0.0572	-0.0633
	(0.2450)	*(0.8840)*	*(0.2790)*	*(0.9940)*	*(0.6810)*	*(0.8870)*
ETA	1.0000 ***	-	1.0000 ***	-	-	-
	(0.0000)	-	*(0.0000)*	-	-	-
Constant	-0.0131 ***	0.0007	-0.0493 ***	-0.0147	-0.0082	-0.0089
	(0.0083)	*(0.9470)*	*(0.0000)*	*(0.4200)*	*(0.4890)*	*(0.5150)*
Observations	73	73	128	128	73	73
R-squared	0.92		0.52			
Number of countries	19	19	19	19	19	19

Notes: Sample includes 19 industrialized countries. HT represents Hausman and Taylor estimator and PT stands for Plümper and Troeger estimator. Numbers in parenthesis are p-values. Standard errors are asymptotic values. *** indicates significance at the 1 percent level, ** indicates significance at the 5 percent level, * indicates significance at the 10 percent level. Song and Thakor (2010) argue that market and bank based institutions are complements rather than substitutes. We therefore include the variable Financial Market Complementarity to take account of this issue (cf. Table A1 for a definition of Financial Market Complementarity). - 1) For better visibility the coefficient is multiplied by a factor 10,000.